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PRIMARY CARCINOMA OF THE LUNG

A DIAGNOSTIC STUDY OF ONE HUNDRED AND THIRTY-FIVE CASES IN FOUR YEARS

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AND

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CHICAGO

Primary carcinoma of the lung is not a rare disease but constitutes about 6 to 8 per cent of all carcinomas.[1] In frequency it ranks next to malignant conditions of the gastro-intestinal tract. Twenty years ago only 5 per cent of the cases were diagnosed clinically; today about 50 per cent are recognized during life. After a ten year study of this subject we are convinced that at least 90 per cent of the cases can be diagnosed. The clinician who is familiar with the pathologic and clinical manifestations of primary lung carcinoma can recognize most cases from the history, physical examination and roentgen study. In some cases a bronchoscopic examination, injection of iodized oil or artificial pneumothorax will be necessary. The diagnosis can be confirmed by a biopsy of the frequently enlarged cervical or axillary lymph nodes, by microscopic examination of pleural exudates or pieces of tissue in the sputum, or by removal of a piece of tissue from a bronchus.

During a four year period we have studied 135 cases of primary carcinoma of the lung. Most of these patients were seen at the Cook County Hospital, the rest in private practice and in other hospitals. Seventy-four cases were confirmed by necropsy, twenty-six by biopsy and thirteen by bronchoscopy, and twenty-two were diagnosed from the characteristic clinical and roentgen manifestations. This study has indicated that cancer of the lung is one of the most important pulmonary diseases in people past 40 years of age. It must always be considered in dealing with cases of lung abscess, bronchiectasis, recurrent pneumonia, empyema, hemorrhagic pleurisy and chronic pneumonia.

Pain in the chest or in other parts of the body, accompanied by a cough and bloody sputum and sooner or later followed by dyspnea, is the cardinal symptom. An area of pulmonary infiltration or atelectasis, enlarged supraclavicular or axillary lymph nodes, a hemorrhagic pleural effusion, paralysis of a diaphragm or of one of the vocal cords, a Horner syndrome, and evidence of bone, brain, liver or other metastases make the diagnosis quite certain. Tuberculosis is usually easily excluded but may occasionally accompany lung carcinoma. The roentgen signs are diagnostic in a high percentage of cases. The bronchoscope is of great value in confirming the diagnosis and in treatment, but the correct diagnosis can be made in most cases without its use. The finding of carcinoma in a biopsy from an enlarged lymph node, a bronchus, tissue in the sputum, sediment from a pleural effusion, or a piece of tissue obtained by thoracotomy completes the diagnosis. We shall at this time discuss our observations, with special attention to the diagnosis of primary carcinoma of the lung, and shall publish a more complete study at a later date.

AGE, SEX AND RACE

Among our 135 cases we find that 72 per cent occurred between the ages of 41 and 60 years. Twelve patients, or about 9 per cent, were from 21 to 40 years old. Table 1 gives the age incidence.

Ninety per cent of all our patients were chronic smokers, and we believe that the inhalation of tobacco smoke may be an important factor in producing chronic irritation with epithelial metaplasia in the bronchi or bronchioles. There were only twelve cases, or 9 per cent, among Negroes, all of whom were patients at the Cook County Hospital, where about 30 per cent of all the patients are colored. There were 125 men and only ten women in our series.

PATHOLOGIC CHANGES

Certain pathologic changes in this series are of great importance from the diagnostic standpoint, and these will be considered. Of the 135 cases eighty-two, or 60 per cent, occurred in the right lung and fifty-three, or 40 per cent, in the left lung. In the seventy-four necropsy cases there were forty-two in the right lung and thirty-two in the left. The greatest number of carcinomas were found in the right upper lobe with twenty-four, left upper thirteen, left lower twelve, and right lower eleven. Seven involved the entire left lung and six the entire right lung. Only one was primary in the right middle lobe.

All carcinomas of the lung are bronchogenic in origin.[2] They arise in the trachea, bronchi or bronchioles. There can be no carcinoma primary in the alveoli, as they have no epithelial lining. The tumors arise from a metaplasia of the basal cell layers of epithelium, less differentiated multipotential cells which can reproduce

From the Medical Service of Dr. Aaron Arkin, Cook County Hospital and the Cook County Graduate School of Medicine.

1. Arkin, Aaron: Bronchus Carcinoma, M. Clin. North America **13**: 1255 (March) 1930. Adler, Isaac: Primary Malignant Growths of the Lungs and Bronchi, New York, Longmans, Green & Co., 1912. Biberfeld, H.: Zur Statistik und Klinik der Lungengeschwülste, Med. Klin. **22**: 1371 (Sept. 3) 1926. Hanf, Dora: Zur Frage der Zunahme der Lungenkrebses in den letzten Jahren, Virchows Arch. f. path. Anat. **264**: 366, 1927. Holzer, H.: Zur Frage der Häufigkeit des Bronchialkrebses, Med. Klin. **21**: 1238 (Aug. 14) 1925. Junghanns, H.: Der Krebs der Lungen Bronchien und oberen Luftwege: Eine Statistik über 405 Fälle, Ztschr. f. Krebsforsch. **28**: 573, 1929. Rosahn, P. D.: The Incidence of Primary Carcinoma of the Lung, Am. J. M. Sc. **179**: 803 (June) 1930. Sonnfeld, A.: Die Klinik des primären Bronchialcarcinoms, Ergebn. d. ges. Med. **8**: 546, 1926.

2. Fried, B. M.: Primary Carcinoma of the Lung, Medicine **10**: 373-508 (Dec.) 1931.

columnar epithelium, squamous epithelium, or undifferentiated round or spindle cells. Such metaplasia of the bronchial epithelium has been found in influenza.[3] Some tumors may arise from the mucus-secreting glands of the bronchi. There are, therefore, three types of carcinoma: (1) adenocarcinoma, (2) squamous cell and (3) undifferentiated round or spindle cell. In our seventy-four necropsy cases twenty-one, or 28 per cent, were adenocarcinomas, eighteen, or 24 per cent, were squamous cell and thirty-one, or 41 per cent, were undifferentiated round or spindle cell.

TABLE 1.—*Ages of the Patients*

Age	Number of Patients	Per Cent
21 to 30	3	2.2
31 to 40	9	6.6
41 to 50	39	29.0
51 to 60	59	43.7
61 to 70	22	16.3
71 to 80	3	2.2

The round and spindle cell carcinomas are the ones which were in the past often erroneously diagnosed as lung or mediastinal sarcomas.[4] All this type presented metastases at necropsy. All showed involvement of the bronchial lymph nodes. The abdominal lymph nodes were invaded in 50 per cent of the cases, the brain in 16 per cent and the bones in 21 per cent.

The adenocarcinomas are almost as malignant as the round cell form. All this group presented metastases. Bone lesions were most frequent, with 48 per cent of the cases showing bone metastases.

The squamous cell carcinomas are less malignant than the other forms and offer the best prognosis for early surgical removal. Still six of eighteen cases presented brain metastases. Metastases in the liver, kidneys and adrenals were only one-third as frequent as in the other types.

The great importance of the frequent lymphogenic and hematogenic metastases in the diagnosis of primary carcinoma of the lung will be emphasized when we discuss the different clinical types of this disease. Not only is dissemination by the blood stream (owing to the ready access of the tumor to the pulmonary veins and vena cavas) a common occurrence, but also extension from the tracheobronchial lymph nodes to the periaortic, peripancreatic, perigastric, periportal and retroperitoneal nodes. The presence of abdominal tumor masses may easily lead to an erroneous diagnosis.

Of the seventy-four necropsy cases all but one presented metastases, and this case was a squamous cell carcinoma. A knowledge of the histologic types of lung carcinoma is of importance to the clinician as well as to the pathologist. The physician should order a biopsy whenever there are accessible cervical or axillary gland masses, pleural effusions, tumor tissue on bronchoscopic examination, or operation on the chest wall. Bone metastases, tumor tissue found during an exploratory laparotomy, or skin nodules may furnish material for the diagnosis. A knowledge of the three important histologic types is therefore of great diagnostic value. Undoubtedly in the past adenocarcinoma of the lung with abdominal metastases was sometimes mistaken for a primary carcinoma of an abdominal organ unless a complete and careful necropsy was obtained. We know that most of the round cell, oat cell, or spindle cell "sarcomas" of the lung are really carcinomas of bronchogenic origin. A round cell carcinoma metastasis in a lymph node may be mistaken for a lymphosarcoma.

Anatomically we have divided our cases of lung carcinoma into five types: (1) intrabronchial, (2) hilar or central, (3) intermediary, (4) peripheral and (5) lobar or diffuse. Such a division is of importance in the early diagnosis of this disease. The physical and roentgen changes, symptoms, and operability depend largely on the location of the tumor in the early stage. These types, of course, are not sharply defined and merge into one another with the progress of the disease.

Associated pathologic lung changes are very frequent and may mask the underlying primary disease. Lobar pneumonia and bronchopneumonia occurred in 28 per cent, chronic pneumonia in 20 per cent, and bronchiectases in 43 per cent. Abscess or gangrene, either in the tumor itself or in the surrounding lung parenchyma, developed in 20 per cent. Pleural involvement with a carcinomatous lymphangitis, hemorrhagic, serous or purulent exudate or marked thickening was found in 50 per cent of the cases at necropsy. Atelectasis of part of a lobe or an entire lobe was often due to bronchus stenosis. Active pulmonary tuberculosis was found in only three of seventy-four cases and is certainly not a factor in the causation of lung cancer. Pneumoconiosis was rare.

SYMPTOMS

The failure to recognize lung carcinoma more frequently can be attributed in part to the great variation in the symptoms of this disease. These symptoms depend on the location and size of the primary tumor, the secondary changes that so often occur, and the location of metastases. In a small group, about 15 per cent, the primary tumor produces no signs or symptoms. Some of these cases can be diagnosed by bronchoscopy if the lesion is in a large bronchus, but this is seldom done when there are no pulmonary symptoms. This occult type causes symptoms when lymphogenic or hematogenic metastases develop.

TABLE 2.—*Metastases in Seventy-Four Necropsy Cases*

	Number	Per Cent
Regional lymph nodes (tracheobronchial, bronchial)	65	88
Cervical lymph nodes (clinical finding)	40	54
Axillary lymph nodes (clinical finding)	20	27
Abdominal lymph nodes	28	38
Pleura	33	45
Adrenals	32	43
Liver	29	40
Kidneys	24	32
Lungs	22	30
Bones	21	28
Nervous system	18	24
Pancreas	11	15
Heart and pericardium	10	14
Compression of superior vena cava	9	12
Intestinal tract	8	11
Pulmonary veins (main vessels)	7	10
Spleen	6	8
Skin	7	10
Esophagus	5	7
Thyroid	4	5
Cervical sympathetics	7	10
Inferior vena cava	3	4
Pulmonary artery (compression)	2	3
Testicle	1	1.4
Urinary bladder	1	1.4
Seminal vesicles	1	1.4
Aorta (compression)	1	1.4

In our large series of 135 cases sixty-nine patients, or 51 per cent, had chiefly extrapulmonary manifestations. The signs and symptoms were predominantly outside the lungs. Only sixty-six patients, or 49 per cent, had symptoms that were largely pulmonary. We have classified our cases into clinical types with reference to the outstanding clinical manifestations (table 4).

3. Askanazy, M.: Ueber die Veränderungen der grossen Luftwege bei der Influenza, Cor.-Bl. f. Schweiz. Aerzte **49**: 465 (April 12) 1919. Winternitz, M. C.; Wason, J. M., and McNamara, F. P.: The Pathology of Influenza, New Haven, Conn., Yale University Press, 1920.

4. Barnard, W. G.: The Nature of the "Oat-Celled Sarcoma" of the Mediastinum, J. Path. & Bact. **29**: 241 (July) 1926.

Pulmonary Type.—In the pulmonary type the symptoms are usually a cough, hemoptysis, pain in the chest, and dyspnea. These symptoms in a person past the age of 40 are very suggestive of carcinoma of the lung. The average duration of symptoms at the time of the first examination was eight months. In a few cases the symptoms dated back three years or longer, and it is interesting that these were mostly cases of squamous cell carcinoma. In other cases the complaints were of short duration, a few days to a few weeks, with onset with a chill and fever as in pneumonia. A history of repeated attacks of bronchitis, pleurisy or pneumonia was given by 25 per cent of the patients.

TABLE 3.—*Metastases in the Different Histologic Types of Lung Carcinoma*

No. of Cases	Type	Tracheobronchial Bronchial Nodes	Abdominal Nodes	Central Nervous System	Liver	Kidneys	Adrenals	Bones
24	Round cell	24 (100%)	12 (50%)	4 (16%)	14 (58%)	8 (33%)	12 (50%)	5 (21%)
21	Adenocarcinoma	17 (81%)	10 (48%)	5 (24%)	10 (48%)	9 (43%)	12 (57%)	10 (48%)
18	Squamous cell	13 (72%)	1 (6%)	6 (33%)	3 (16%)	4 (22%)	3 (16%)	3 (16%)
7	Spindle cell	7 (100%)	4 (57%)	2 (28%)	0	1 (14%)	3 (43%)	2 (28%)
4	Miscellaneous	4 (100%)	1 (25%)	1 (25%)	2 (50%)	2 (50%)	2 (50%)	1 (25%)
74	Totals	65 (88%)	28 (38%)	18 (24%)	29 (40%)	24 (32%)	32 (43%)	21 (28%)

The cough is usually progressive and fails to respond to rest or medication. It is dry at first, later often productive of a blood-streaked mucoid or purulent sputum. In some cases there is a sudden onset of the cough with pneumonic symptoms. Because of the bloody sputum a diagnosis of tuberculosis is frequently made, although tubercle bacilli are absent. Later a brassy pressure cough, often with an asthmatoid wheeze, causes great discomfort. A persistent cough was present in 106 of our 135 cases, about 80 per cent.

Hemoptysis is often the first symptom of lung carcinoma. At first the sputum is blood streaked only at intervals. Later a severe hemoptysis may occur. We have seen several cases in which there was fatal hemorrhage. Bloody expectoration in the absence of pulmonary tuberculosis or mycosis or cardiac disease is very suggestive of lung cancer. The sputum should always be carefully examined for tissue fragments. Fixation and microscopic sections may make the diagnosis certain. We have found tumor tissue in the sputum in several cases. Hemoptysis occurred in fifty-eight of our cases, or 43 per cent.

Pain is the second most frequent symptom. It is more continuous than in any other thoracic disease except possibly aortic aneurysm with bone destruction. The pain is sharp and lancinating and is usually due to involvement of the pleura, intercostal nerves or bony structures. Metastases in the spine and ribs are very frequent. In patients with pleural effusion the pain does not disappear with the development of the effusion but becomes more and more severe. Such continuous pain in the chest, in the absence of an aneurysm or metastases from some other source than the lungs, is almost diagnostic. Often the pain is aggravated or induced by percussion of the chest. This finding we consider highly significant. Thoracic pain occurred in seventy-nine, or 58 per cent, of all cases, and extrathoracic pain in fifty-eight patients, or 43 per cent. Ninety-nine, or 73 per cent, suffered severe pain.

Dyspnea may be an early or a late symptom. It may be due to stenosis of a bronchus by the tumor or compression of the trachea or bronchi by lymph node metastases. With the dyspnea there is often an asthmatoid wheeze or brassy cough. Other causes of dyspnea are large pleural effusions, pressure on the superior vena cava or pulmonary blood vessels, pericarditis, atelectasis, or acute or chronic pneumonia. Dyspnea was marked in seventy patients, or 52 per cent.

The general effects of lung carcinoma are mainly loss of weight, fever, weakness, night sweats, and fatigue. A leukocytosis is common. Clubbed fingers occurred in 15 per cent of the cases. The symptoms due to metastases or extension from the primary tumor are of great importance, as will be seen from a discussion of the other clinical types.

Osseous Type.—This is one of the most frequent forms encountered by us. Of thirty-five patients with bone metastases among 135 cases, we have placed twenty-one in this group. The first complaint is sharp severe pain in the chest wall, often limited to certain ribs, or in the spine, skull, pelvic bones or an extremity. The patient may enter with a pathologic fracture, as did three of our patients. A careful history usually but not always elicits the presence of a cough or hemoptysis. Roentgenograms of the painful parts usually present the changes of osteolytic or osteoclastic metastases. There are irregular small or large areas of bone destruction. We have found them most often in the ribs, skull, pelvic bones, sternum, ends of the long bones, scapula and clavicle. Sometimes large soft tumor masses develop, which may be mistaken for a bone sarcoma. In all cases of osteoclastic bone metastases a lung carcinoma must be considered as the primary site. In our experience lung cancer is one of the most frequent causes of osteoclastic bone metastases. In the differential diagnosis of bone metastases breast, thyroid and kidney carcinoma, melanoblastoma, ovarian carcinoma, and any other malignant condition must be considered. We have recently had two cases of stomach carcinoma presenting bone metastases in the ribs, clavicles and spine.

Cerebral Type.—This group is next in frequency. Twenty of 135 patients presented symptoms in the central nervous system. Of these we have included thirteen cases in this group because of the outstanding cerebral changes. Five of the patients were admitted to neurologic services. Some were at first diagnosed as cerebrospinal syphilis, meningitis, brain abscess, encephalitis, cerebral hemorrhage, or brain tumor. When a person of middle age has an abrupt onset of signs and symptoms of a rapidly developing intracranial lesion a metastatic lung carcinoma should be considered and the lungs carefully examined and roentgenographed. Any part of the brain or cord may be affected. The cranial nerve centers are often involved, or there is a hemiplegia. Headache is common. The patient may be admitted in coma. A careful neurologic exam-

TABLE 4.—*Clinical Types of Lung Carcinoma*

	Cases	Per Cent
1. Pulmonary	66	49
2. Osseous	21	16
3. Cerebral	13	10
4. Cardiac	12	9
5. Gastro-intestinal	11	8
6. Lymphoglandular	9	6
7. Hepatic	3	2

ination is indicated in every patient with lung cancer. Brain metastases were found in eighteen of seventy-four necropsy cases, or 24 per cent. Not all these presented clinical symptoms.

Cardiac Type.—This series includes twelve cases in which heart signs and symptoms were outstanding and the lung changes less evident. The heart, pericardium and great vessels are frequently invaded by the tumor. Cancer of the right upper lobe often compresses or invades the superior vena cava or innominate vein, with symptoms like those of a mediastinal tumor. The clinical picture of a right heart hypertension or decompensation has occurred in a number of cases. In two cases the pulmonary artery was surrounded and compressed; in seven the pulmonary veins were stenosed. The extensive perivascular carcinomatous lymphangitis may cause narrowing of many smaller pulmonary vessels. Infiltration of the pericardium and myocardium occurred in ten cases. Sometimes the inferior vena cava or hepatic veins are involved, producing hepatic enlargement and stasis with ascites, and edema of the lower extremities. The chief symptoms in this cardiac group are dyspnea, cyanosis, edema, cardiac enlargement and occasionally ascites.

Gastro-Intestinal Type.—Here we have included eleven cases. The chief cause of the gastro-intestinal signs and symptoms is the presence of abdominal metastases. Thirty-eight per cent of our necropsy cases revealed metastases in the abdominal lymph nodes. These form huge masses in the periaortic, peripancreatic, perigastric and periportal nodes. The liver was enlarged in 24 per cent of all our cases and showed metastases in 40 per cent of the necropsy cases. In four cases a large nodular epigastric tumor was mistaken for a carcinoma of the stomach or colon. Even the roentgen examination may be misleading. We have seen filling defects due to compression or infiltration of the stomach wall. In two cases the metastases led to pyloric obstruction. In three, gastric or duodenal hemorrhages followed compression with secondary ulceration. With jaundice, which occurred in six cases, a carcinoma of the pancreas may be suspected. Nine of our patients complained of difficulty in swallowing, and in six of these the dysphagia was the first complaint. We were able to demonstrate compression of the esophagus by gland metastases in all these cases on roentgen examination with thick barium paste.

Lymphoglandular Type.—This form is due to extensive metastases in the supraclavicular, cervical or axillary lymph nodes as well as in the deeper nodes. One of our most valuable aids in the diagnosis of primary lung cancer has been a careful examination for enlarged cervical or axillary nodes. A large hard node is frequently found above the clavicle or behind the head of the clavicle. The diseases that cause the greatest difficulty in differential diagnosis are Hodgkin's disease and lymphosarcoma. When a node is accessible, a biopsy should always be done. In nine of our cases large hard cervical or axillary gland tumors were the outstanding manifestation. In two cases it was difficult to distinguish the gland masses from a primary carcinoma of the thyroid until the lung examination and biopsy showed lung carcinoma. Small carcinomas of the piriform sinus, nasopharynx or accessory nasal sinuses may produce large cervical metastases, and these must be excluded in a differential diagnosis.

Hepatic Type.—Here we have placed several cases presenting extensive liver metastases and great enlargement of the liver accompanied by jaundice. The jaundice is usually due to compression of the larger bile ducts or the common duct. Liver enlargement was found on physical examination in 24 per cent of all our cases. The large liver and icterus may easily lead to the diagnosis of a carcinoma of the head of the pancreas with liver metastases, or a primary malignant hepatoma when the gastro-intestinal tract is normal.

LUNG CHANGES

The physical changes vary greatly with the size and location of the tumor. In about 15 per cent of the cases there are no positive lung changes. These are the patients who present themselves because of bloody expectoration, pain or cough. Until the tumor produces stenosis of a bronchus with atelectasis or involves the peripheral lung tissue the percussion and auscultation may reveal nothing. However, the roentgen examination may be diagnostic even in the early stages.

The endobronchial form produces stenosis of a bronchus with atelectasis. There is dulness with suppressed or absent breath sounds. The chest wall is retracted with reduced mobility. The diaphragm is often elevated and the heart displaced toward the affected side. The absence of adventitious sounds speaks against tuberculosis. With partial bronchial occlusion there may be the characteristic cornage breath sounds, a peculiar type of tubular breathing.

The hilar or central form is one of the most frequent types, because many of the carcinomas originate in a main bronchus. There is often dulness or flatness on percussion to the right of the sternum or to the left of the heart. We have often found paravertebral dulness at the level of the second to fourth dorsal spines. Hard enlarged supraclavicular or axillary lymph nodes point to lung carcinoma. In the nodular type of tumor the phenomena are those of a mediastinal tumor with dulness and pressure symptoms. There is often an asthmatoid wheeze, brassy cough, distention of the veins of the head and neck, and cyanosis. When flatness extends to the infraclavicular region with suppressed or absent breath sounds, the diagnosis is easy. A high diaphragm with paradoxical movement, a Horner syndrome, paralysis of a vocal cord or dysphagia often occurs and assists in making the correct diagnosis. The abdomen should always be carefully examined for liver enlargement or tumor masses.

The lobar form occurs most often in the upper lobes, where the diagnosis is usually easy to make. There is a peculiar flatness with increased resistance on percussion. The flatness often has a convex lower border. It extends beyond the sternum to the opposite side, because of mediastinal infiltration. This observation one of us[1] emphasized in 1930. Over the area of flatness the breath sounds are weak or absent and the auscultatory changes are minimal. Occasionally loud bronchial breathing is heard when the bronchus is not obstructed. Cornage breath sounds, flatness, bloody sputum and enlarged supraclavicular nodes are the chief characteristics of this form. In the late stage the entire lung may be involved or an extensive hemorrhagic pleural effusion may develop, with little or no cardiac displacement. Aspiration and artificial pneumothorax may be necessary to reveal the underlying lung tumor. The fluid should be examined for tumor cells.

ROENTGEN EXAMINATION

In the diagnosis of primary carcinoma of the lung the roentgen ray is an indispensable aid. Not only will it confirm the clinical diagnosis in a high percentage

of cases but it will also reveal certain cases that cannot be diagnosed in any other way. After a wide experience with numerous postmortem studies we are prepared to state that about two thirds of the cases can be diagnosed from the roentgen study alone. In the other one third a pleural effusion or empyema, pneumonia or lung abscess, marked pleural thickening, or involvement of an entire lung may make the roentgen diagnosis difficult or impossible. Even in this difficult group greater exposure of the affected side will often reveal diagnostic changes. Injection of iodized oil often discloses stenosis of a bronchus by the tumor. An enlargement, distortion and increased density of the hilar shadow on the opposite side, bone metastases, paralysis of a diaphragm, a massive effusion with little or no cardiac displacements, or lung metastases, are all x-ray aids to a correct diagnosis. In difficult cases the bronchoscope may be necessary for the final decision.

The hilar type leads to an enlarged dense hilar shadow. It is often composed of the nodular tumor, bronchial gland metastases, and lymphangitis along the blood vessels and bronchi. A branching radiary shadow invades the lung field, with increase in the size, density and number of the lung markings. The picture is so characteristic that the diagnosis is usually easy. In some cases Hodgkin's disease or lymphosarcoma may produce a similar picture, and then a biopsy of a lymph node or piece of tissue from a bronchus may be necessary for diagnosis. Often there is the picture of a lymphangitis carcinomatosa with numerous small shadows connected by a fine network. Obstruction of a bronchus leads to the picture of atelectasis with traction of the heart to the affected side, often a high diaphragm, and marked reduction in size of the lobe. The border is often sharply defined before tumor infiltration takes place. Atelectasis plays an important rôle in producing the early shadows of lung carcinoma.[5]

The lobar type produces a very dense shadow. The outline at the interlobar fissure may be sharp and convex. Later it becomes irregular, with many projections into the adjacent lobe. In the upper lobe the convexity of the lower border usually distinguishes carcinoma from tuberculosis or pneumonia. The hilar markings are enlarged, sometimes with nodular tumor shadows. Soon the shadow invades the adjacent lobe, sending numerous branching strands into the lung parenchyma. The diaphragm may stand high, owing to involvement of the phrenic nerve. Iodized oil often reveals the bronchus stenosis. Bronchiectases or abscesses are frequent occurrences in the tumor or surrounding lung tissue. A long exposure of the film is often necessary to reveal them. The tumor is usually radioresistant and does not decrease much after roentgen therapy.

Table 5 gives the important clinical observations in this series of 135 cases of primary carcinoma of the lung. Further details with illustrative cases will be published later.

SUMMARY

Primary carcinoma of the lung is one of the most frequent forms of malignancy in adults. It ranks second to gastro-intestinal carcinoma and constitutes from 6 to 8 per cent of all malignant tumors. About 75 per cent of the cases occur between the ages of 40 and 60 years. In our series of 135 cases it was twelve times as frequent in males as in females.

The right upper lobe is the most common site. The tumors are all bronchogenic in origin and begin as a metaplasia of the basal epithelial cells. There are three important histologic types: (1) undifferentiated round or spindle cell, (2) adenocarcinoma and (3) squamous cell. All types have a marked tendency to produce lymphogenic and hematogenic metastases, but the squamous cell is usually less malignant than the other two types. Of seventy-four cases that came to necropsy only one presented no metastases. Eighty-eight per cent showed hilar gland metastases, 38 per cent abdominal lymph node, 40 per cent liver, 32 per cent kidney, 43 per cent suprarenal, 28 per cent bone, and 24 per cent brain metastases. The chief associated lung changes were pleural effusions (47 per cent), bronchiectases (43 per cent), acute pneumonias (28 per cent), chronic pneumonia (20 per cent), abscess or gangrene (20 per cent) and purulent bronchitis (19 per cent).

In 51 per cent of all cases the signs and symptoms were predominantly outside the lungs; only 49 per cent presented changes that were largely thoracic. This important fact explains the present failure in most clinics to diagnose 50 per cent of the cases. In the hope of bringing the correct diagnoses to 90 per cent, where we think they ought to be, we have divided the cases into the following clinical types and discussed each: (1) pulmonary, (2) osseous, (3) cerebral, (4) cardiac, (5) gastro-intestinal, (6) lymphoglandular and (7) hepatic.

The peculiarly characteristic history of pulmonary well being to within an average period of eight months before seeking medical aid, the development of bronchitis or recurrent attacks of pneumonia or pleurisy, followed by persistent cough, pulmonary or extrapulmonary pain, hemoptysis, and dyspnea, should enable the physician to suspect lung carcinoma. A characteristic complex of physical changes is observed in most cases. The roentgen study alone makes the diagnosis possible in at least two thirds of the cases. The bronchoscope is of great value in confirming the diagnosis, but most cases can be recognized without it. The presence of one of the three types of carcinoma in a biopsy specimen from a bronchus, lymph nodes, pleural exudate, or tissue found in the sputum will establish the diagnosis.

55 East Washington Street.

TABLE 5.—*Observations in One Hundred and Thirty-Five Cases of Primary Carcinoma of the Lung*

	Cases	Per Cent
Positive physical changes in the chest	110	82
Cough	106	80
Pain (thoracic, extrathoracic)	99	73
Loss of weight (10 pounds or more)	86	64
Dyspnea	70	52
Hemoptysis	58	43
Purulent sputum	19	14
Cervical adenopathy	53	40
Axillary adenopathy	37	28
Leukocytosis (10,000 or more)	37	28
Fever (1 degree F. or more)	37	28
Demonstrable bone metastases	35	26
Liver enlargement	32	24
Cyanosis	28	21
Clubbed fingers	21	15
Dilated veins of neck, chest	21	15
Paralysis of diaphragm	20	15
Central nervous system involvement	20	15
Hoarseness	18	13
Asthmatoid wheeze	13	10
Recurrent laryngeal nerve paralysis	10	8
Dysphagia	9	7
Horner syndrome	8	6
Skin metastases	7	5
Subleukemic blood picture	6	4
Jaundice	6	4
Anisocoria	4	3

5. Cohn, Max: Die nichttuberkulösen Lungenkrankheiten im Röntgenbilde, Würzburger Abhandlungen a. d. ges. d. Med. **21**: 361, 1924.

USE OF THE X-RAYS IN PULMONARY TUBERCULOSIS

FROM THE POINT OF VIEW OF PROGNOSIS

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The value of the x-rays in the diagnosis of pulmonary tuberculosis has been well established. I also feel that, without their use, one would be greatly handicapped in following the clinical course of the disease, as well as in determining the proper treatment. Besides this, I am strongly of the opinion that much valuable information can be obtained by a careful study of chest x-ray films in predicting the future trend of the disease and the patient's chance of ultimate recovery.

In this study the following points are to be considered purely in relation to their effect on prognosis: 1. Extent of disease as based on the roentgen examination. 2. Character and types of shadows. 3. Absence or presence of cavities. 4. Behavior of cavities. 5. Increase or decrease of x-ray shadows. 6. Prognostic significance of (*a*) fever versus x-ray shadows, (*b*) fever versus comparative x-ray studies, and (*c*) râles versus x-ray shadows. 7. Relapse in relation to comparative x-ray studies.

In order to obtain some statistics on these various points I have selected groups of several hundred consecutive admissions to Trudeau Sanatorium, have studied the x-ray films of these patients, and then have followed the patients in each group for a period of years.

EXTENT OF DISEASE AS BASED ON THE ROENTGEN EXAMINATION

Undoubtedly, all will agree to the general supposition that the greater the lung involvement the worse the prognosis, yet I thought it might be of interest to see just what the actual figures would show. I therefore

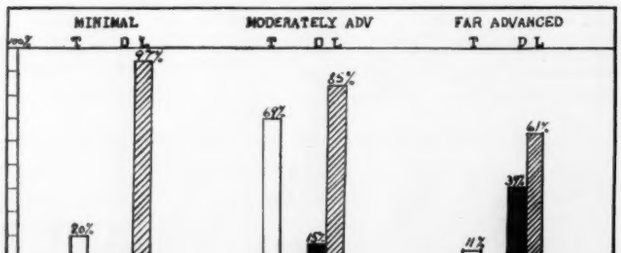

Chart 1.—Incidence of death at the end of five years in 943 cases classified on the basis of the roentgen examination. *T*, total; *D*, dead; *L*, living.

took 943 routine cases admitted to Trudeau Sanatorium within the past seven or eight years and divided them into the three usual groups as determined by the roentgen examination:

A. Minimal: Disease to the second rib and fifth vertebral spine on one side or one-half this amount on both sides.

B. Moderately advanced: Infiltration of one lung or its equivalent, consolidation of one lobe, or cavity up to 4 cm. in size.

C. Far advanced: More involvement than the moderately advanced.

I then looked up their records at the end of five years. These showed that at the end of this period only five patients, or 3 per cent, had died from among the 190 cases in the minimal group. There were ninety-six, or 15 per cent, from the 649 moderately advanced cases; while, of the 104 far advanced cases thirty-nine patients, or 39 per cent, had died. Chart 1 therefore gives some idea of a patient's prognosis at the end of five years, based purely on the amount of lung involvement as revealed by the x-ray film.

Dr. Homer L. Sampson, director of the Trudeau X-Ray Laboratory, assisted the author in compiling statistics for several of the charts.

CHARACTER AND TYPES OF SHADOWS

In recent years there have come to be recognized two rather distinct types of lung shadows cast on the x-ray film, which have been interpreted as indicating equally distinctive underlying pathologic changes. The first of these has the appearance of soft, fluffy smoke, with

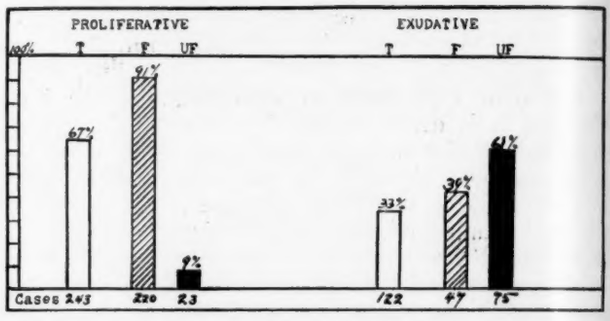

Chart 2.—Progress of 365 cases classified according to types of x-ray shadows. *T*, total; *F*, favorable; *UF*, unfavorable.

very ill defined margins. It is felt that the disease casting this shadow is apt to be both recent and active. To this type of shadow the name "exudative" has been applied. The other type referred to is indicative of the "proliferative" lesion, which, it is felt, is of much longer duration and more fibrous in character. Here the appearance of the lesion on the film is much more clean cut and stringy, with margins well defined.

The patients in these two groups have been studied from a rather different angle than the others here reported. On entrance to the sanatorium 365 cases were classified, according to the films alone, as 243 proliferative and 122 exudative. The behavior of the lesion while the patients were with us under treatment was then watched by their subsequent roentgenograms and the results were recorded as simply "favorable" or "unfavorable." These results were indeed most enlightening, as shown by chart 2, for we found that 220, or 91 per cent, of our "proliferative" group had done well, whereas only forty-seven, or 39 per cent, of our 122 "exudative" cases had made satisfactory progress. Hence the character of the shadow and its proper interpretation are of great value in determining the future course of the disease.

PRESENCE OR ABSENCE OF CAVITIES

Examination of 925 routine admissions to Trudeau Sanatorium ten or fifteen years ago reveals that cavities were read in the films of 392, or 42 per cent, of these cases. Without taking into consideration the amount of involvement in the lungs of these patients but simply the fact of a cavity being present, it is found that at the end of five years 139, or 35 per cent, are dead, while of the remaining 533 patients whose films failed to disclose the presence of a cavity only 108, or 20 per cent, had died. Thus the percentage of deaths among cavity cases was within 5 per cent of double that among noncavity cases.

BEHAVIOR OF CAVITIES

Another angle of this question, which is most important, is how these cavities behave while under treatment. I therefore followed the course of 336 patients with cavities while they were with us and found that in 122 cases, or 36 per cent, the cavities remained approximately the same size. Of these patients forty-one, or 34 per cent, died within five years after leaving the sanatorium. In eighty-one cases, or 24 per cent, the cavities increased in size and this group showed forty-four, or 54 per cent, dead in five years. The films revealed that in 133, or 39 per cent, of the cases the cavities had decreased or had disappeared completely. Of these more fortunate individuals only fifteen, or 11 per cent, had succumbed during the five year period.

THE EFFECT OF INCREASE OR DECREASE OF X-RAY SHADOWS AS DETERMINED BY COMPARATIVE FILMS

The figures for charts 5, 6, 7, 8 and 9 are based on 600 consecutive admissions to Trudeau Sanatorium in which the patients were followed from three to five years after their discharge. They were then classified into the four groups of well, living, dead and unknown. The well group were either working or were able to do so, while the living group includes those patients who are either continuing treatment or about whom we know nothing further than that they are still living.

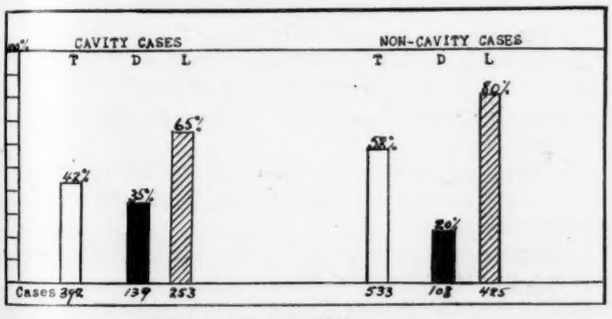

Chart 3.—Percentage of deaths at the end of five years in 925 cases with and without cavities. *T*, total; *D*, dead; *L*, living.

Chart 5 is a comparative study of (1) those patients whose x-ray films showed a steady healing of their disease, each successive film showing either fewer pathologic shadows or, at least, that no new shadows had developed, and (2) those patients who at some time during their stay with us received an unfavorable x-ray report, stating that a comparative reading had shown an increase of infiltration or else that a previously mentioned cavity had become larger.

Fortunately, 80 per cent of the series fell into the former group and of those 72 per cent are found to be well and only 9 per cent dead. These figures are indeed striking when they are compared with the 20 per cent of patients whose films had shown a progression of their disease; for here the percentage of deaths is actually higher than that of recoveries; namely, 37 per cent dead as against 36 per cent recovered.

PROGNOSTIC SIGNIFICANCE

Of (a) *Fever versus X-Ray Shadows.*—From a previous study it had been determined that from a clinical point of view the presence of fever was indicative of a graver prognosis than any other symptom or laboratory finding. I therefore thought that it might be instructive to compare the significance of this symptom with the five year outcome of patients who had shown an increase in their comparative x-ray films while they were in the institution. I found that in our series of 600 patients 168, or 28 per cent, had had fever of 99.6 F. or over for five consecutive days which we were unable to account for from any other source than their tuberculosis. Analysis of these fever cases discloses that only 45 per cent of the patients are well, while 42 per cent died within five years.

As unfavorable as these figures seem to be, it is found that those patients showing a progression of their disease as determined by roentgen examination have just as serious an outlook as their fellow patients who have

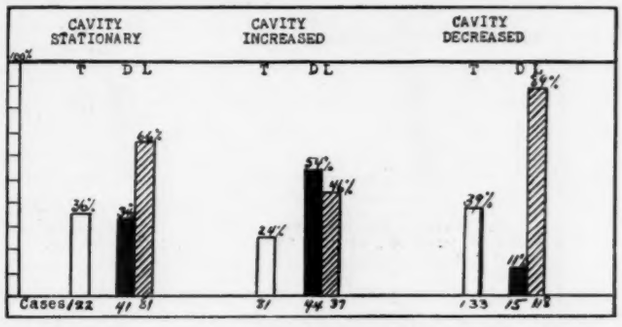

Chart 4.—Percentage of deaths at the end of five years in 336 cases classified as to behavior of cavities under treatment. *T*, total; *D*, dead; *L*, living.

a persistent elevation of temperature. In chart 6 the two conditions are treated independently of each other, whereas of course they are frequently found associated in the same patient. This point will be illustrated later. The most striking thing to note in this chart showing the five year results in patients having an increase in their comparative x-ray shadows is the fact that at the end of this time 1 per cent more are dead (37 per cent) than are well (36 per cent).

Of (b) *Fever versus Comparative X-Ray Studies.*—Chart 7 takes up various combinations of patients with and without fever and also with and without increased x-ray shadows. The columns on the left represent sixty patients, or 9.5 per cent of our total in whom both elevation of temperature and increased x-ray shadows were noted. Among these only 23 per cent were well at the end of five years, while over twice this number, or 51 per cent, had died.

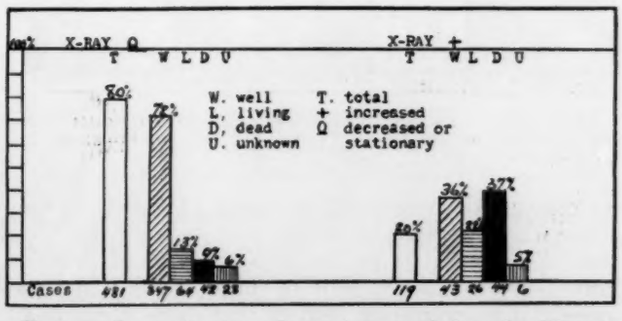

Chart 5.—Increased versus decreased x-ray shadows in 600 cases followed from three to five years.

The next columns to the right show that in 450 patients, or 75.5 per cent, fever was not noted during their stay with us and the x-ray shadows showed the pulmonary process either to have remained unchanged or to have improved. Under these conditions 72.5 per cent, are well, with only 8 per cent of deaths.

Again moving to the right on the chart one finds sixty patients, or 10 per cent of the total, in whom no fever was present, yet the x-rays showed a progression of their disease. The "wells" immediately drop to 48 per cent and the deaths rise to 23 per cent. It is to

be noted particularly that increased x-ray shadows are found in 10 per cent of patients in whom this fact is not indicated by the presence of fever.

The series to the extreme right of this chart indicates that in only 5 per cent of patients having fever did the x-rays fail to show a progression of their disease, while

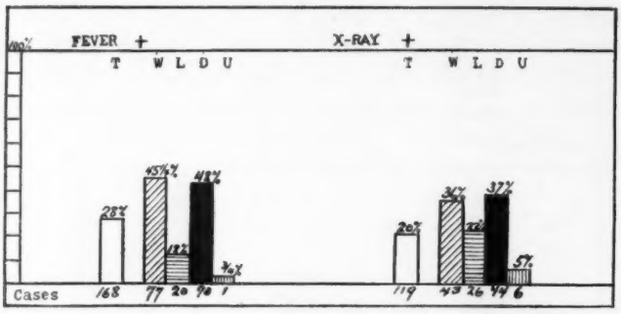

Chart 6.—Fever versus increased x-ray shadows in 600 cases followed for five years. *T*, total; *W*, well; *L*, living; *D*, dead; *U*, unknown.

in this small group with fever but no unfavorable x-ray changes the well column reached 60 per cent and the deaths 20 per cent.

Of (c) *Râles versus X-Ray Shadows.*—The next question to be considered is a comparative study of the importance from a prognostic standpoint of increased and decreased x-ray shadows versus increased and decreased physical signs (râles). Chart 8 seems to show rather clearly that progression of the disease as shown by the roentgen examination is of much graver significance than when it is indicated by physical examination. Of the patients showing an increase of this disease as determined by a larger area over which râles are heard, 55 per cent are well after five years

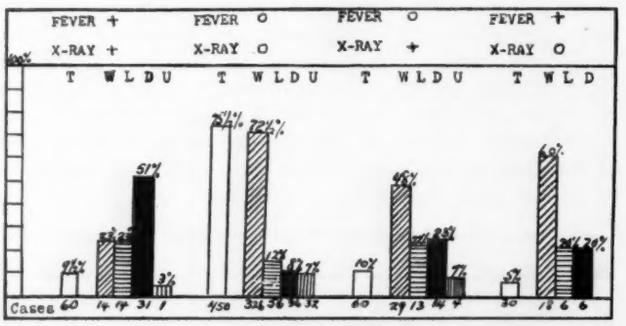
FEVER + X-RAY +
FEVER O X-RAY O
FEVER O X-RAY +
FEVER + X-RAY O
T W L D U
T W L D U
T W L D U
T W L D
Cases 60 14 14 31 1 450 324 36 54 32 60 29 13 14 4 20 18 6 6

Chart 7.—Comparative x-ray studies versus fever in 600 cases followed for from three to five years. *T*, total; *W*, well; *L*, living; *D*, dead; *U*, unknown.

as contrasted to only 36 per cent of "wells" among those whose increase of trouble was shown by the x-ray film. The latter group shows 37 per cent of deaths as contrasted to 22 per cent of those having increased râles. It is interesting to note that there is practically no difference between the x-ray and râle groups in those patients in whom, by either of these two methods of examination, no change or an improvement in their lesions is noted.

RELAPSE IN RELATION TO COMPARATIVE X-RAY STUDIES

Chart 9 takes up the matter from a slightly different angle. Here we have followed the yearly report cards of our 600 patients and have divided them into the following groups:

1. Those whom we have classified as "cured," 53 per cent of the series, refer to those patients who left the sanatorium in good condition and have remained "well" ever since. In this group only 11 per cent had x-ray increases while with us.

2. This class is made up of patients, 11 per cent of the series, who, although they have been "well" for the past one or two years, have had a relapse of their disease at some time during the five year period. Thirteen per cent of this group while with us had had unfavorable x-ray reports.

3. Sixteen per cent of our series after leaving us either relapsed or remained chronically ill. This result was very accurately predicted by their x-ray films, which showed a progression of their disease in 29 per cent of the cases.

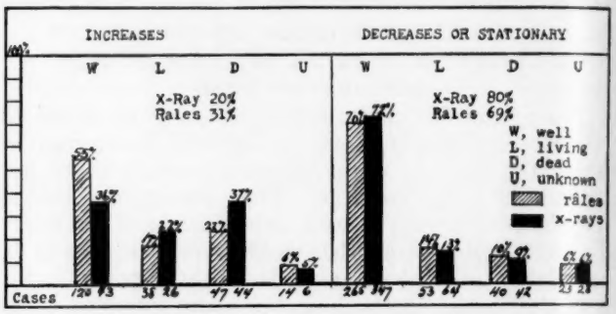

Chart 8.—Râles versus x-ray shadows in 600 cases followed for from three to five years.

4. Among the 14 per cent in our "dead" group the "handwriting on the wall" was fairly well shown by the fact that 49 per cent of them showed unfavorable comparative x-ray films while they were still patients in the sanatorium.

5. The "unknown," or those on whom we have no follow-up record, are only 6 per cent and need no further mention.

The groups just mentioned, together with the figures quoted, are shown in chart 9.

CONCLUSIONS

The study indicates that:

1. The extent of lung involvement greatly influences the prognosis in pulmonary tuberculosis, the death rate being in direct proportion to the amount of disease.

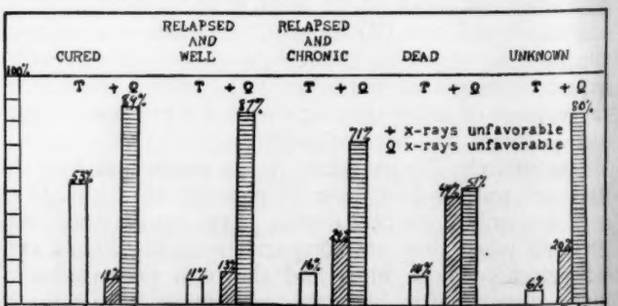

Chart 9.—Incidence of relapse in relation to comparative x-ray studies in 600 cases followed for from three to five years.

2. The prognosis in the "exudative" type of disease is decidedly more unfavorable than in the "proliferative" type.

3. The presence of cavities nearly doubles the probability of death within five years.

4. Cavity cases showing improvement under treatment have approximately five times as favorable prognosis as those in which the cavities become larger during sanatorium residence.

5. Patients whose comparative roentgen examinations are constantly favorable under sanatorium treatment have more than twice as good a chance of being well at the end of a five year period and only one fourth as great a chance of being dead as those who have increased x-ray shadows.

6. Increase in comparative x-ray studies suggests a prognosis about equally unfavorable with that indicated by the presence of fever.

7. Patients with both fever and increased x-ray shadows have six times as unfavorable an outlook as those who are free of fever and whose roentgen examinations show consistent improvement.

8. Increased comparative x-ray shadows are of much graver prognostic significance than increased physical signs (râles).

9. The yearly follow-up records of 600 patients show that the relation of "well," "relapsed but now well," "chronic," and "dead" is in direct ratio to the incidence of x-ray increases while they were under our care.

105 Main Street.

THE ACTUAL VALUE OF CARBON DIOXIDE-OXYGEN INHALATION

IN ACCELERATING THE REDUCTION OF TOTAL BODY ALCOHOL

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AND
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It has long been known that the metabolism of alcohol in the body proceeds at a constant rate for the individual,[1] and the difficulty of effecting a change in this rate has been frequently remarked.[2]

Robinson and Selesnick[3] have recently reported striking reduction of the venous blood alcohol in inebriates who have been subjected to the inhalation of a mixture of 90 per cent oxygen and 10 per cent carbon dioxide for a period of thirty minutes. This amounted in a number of cases to approximately one fourth of the original value. They state that this is "proof of the efficacy of carbon dioxide-oxygen inhalation in causing an accelerated significant decrease in total body alcohol level," since, as they further state, "an accelerated decrease in venous blood alcohol with carbon dioxide-oxygen therapy represents an accelerated decrease in total body alcohol."

Such a striking effect certainly merited experimental investigation. The first obstacle to this was the mixed nature of the therapy, as both carbon dioxide and oxygen were employed simultaneously. Fortunately, however, Fleming and Reynolds[2] have investigated the effect of oxygen inhalation on the rate of disappearance of alcohol from the blood and found it to be negligible, while Barach[4] found the lethal dose of alcohol for rabbits to be the same in an atmosphere of oxygen as it was in air. Thus we need concern ourselves with carbon dioxide alone. As early as 1924 Hunter and Mudd[5] administered a test dose of alcohol to a single subject on two occasions, once with and once without inhalation of carbon dioxide. They interpret their results to indicate that the reduction of blood alcohol proceeds more rapidly when carbon dioxide is administered, but this interpretation is not agreed to by Fleming and Reynolds,[2] who found no effect from inhalation of either carbon dioxide or oxygen.

Since the absence of reduction of blood alcohol in some of the cases reported by Robinson and Selesnick is ascribed by them to the possibility that further absorption from the gastro-intestinal tract took place, we determined to obviate this chance for error by administering the alcohol intravenously. To each of two human subjects a dose of 2 cc. of ethyl alcohol per kilogram of body weight was administered intravenously, as a 20 per cent solution in physiologic solution of sodium chloride, the injection taking one hour. An hour was allowed to elapse for equilibration of the alcohol between the blood and tissues, at the end of which time the first blood sample was taken. After another hour a second blood sample was taken, the minute volume of respiration determined with a spirometer, and inhalation of carbon dioxide 10 per cent and oxygen 90 per cent begun, an open slot mask being used, so that no rebreathing occurred. This was continued for thirty minutes, during which time the respiratory minute volume was twice determined and blood samples were taken. After the inhalation period, blood samples were again obtained at appropriate intervals. The alcohol content of all the samples was determined by a modification of the method of Cannan and Sulzer.[6] The curve of the blood alcohol in one of these subjects is seen in the accompanying chart. It will be noted that the rate of fall of the blood alcohol significantly increases during the period of inhalation but that on its discontinuance a rise occurs, followed by a period of slower fall, and finally a rate comparable to that before the inhalation was begun.

Change in the Rate of Decrease of Venous Blood Alcohol Effected by Inhalation of Carbon Dioxide-Oxygen Mixture After a Dose of Alcohol of 4 Cc. per Kilogram Intravenously in Dogs

Animal	Maximum Blood Alcohol, Mg. per 100 Cc.	Rate of Decrease of Blood Alcohol, in Mg. per 100 Cc. per Hour			
		Before Inhalation	During Inhalation	¼ Hr. after Inhalation	1½ Hrs. after Inhalation
1	381	22	34	6	19
2	372	23	20	2	24
3	370	18	48	6	18

To confirm these results with higher doses, giving blood alcohol levels comparable to those of the inebriates reported by Robinson and Selesnick, the same procedure was repeated, using dogs, with a dose twice that given to the human subjects, namely, 4 cc. per kilogram. This was sufficient in all cases to produce a state of coma from which the animals could not be aroused. It is of interest from the clinical point of view, with which we are not here specifically concerned, that none of the dogs were any more easily aroused after the carbon

From the Division of Neuropsychiatry, Department of Medicine, Stanford University School of Medicine.

Supported by a grant from the Rockefeller Fluid Research Fund of the Stanford University School of Medicine.

1. Mellanby, Edward: British Medical Research Committee, Special Report Series 31, 1919, p. 1. Newman, H. W., and Cutting, W. C.: Alcohol Injected Intravenously: Rate of Disappearance from the Blood Stream in Man, J. Pharmacol. & Exper. Therap. **54**: 371 (Aug.) 1935.

2. Fleming, Robert, and Reynolds, Dorothy: Experimental Studies in Alcoholism: IV. Attempts to Modify Concentration of Alcohol in Blood After Intravenous Administration of Alcohol, J. Pharmacol. & Exper. Therap. **54**: 236 (June) 1935. Newman, H. W., and Cutting, W. C.: The Action of Dinitrophenol and Insulin in Accelerating the Metabolism of Ethyl Alcohol, J. Clin. Investigation **14**: 945 (Nov.) 1935.

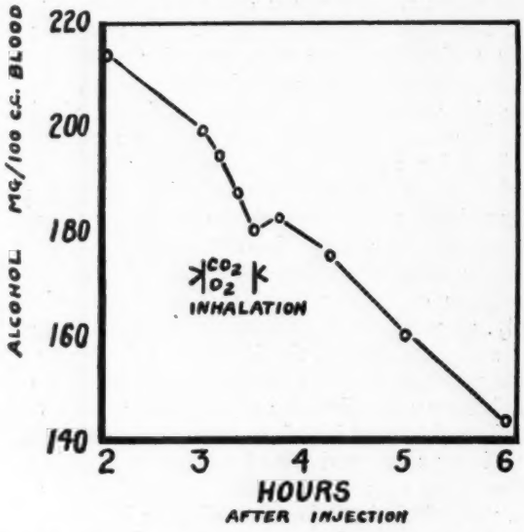
3. Robinson, L. J., and Selesnick, Sydney: The Treatment of Acute Alcoholism with Ten Per Cent Carbon Dioxide and Ninety Per Cent Oxygen Inhalation, J. A. M. A. **105**: 1734 (Nov. 30) 1935.

4. Barach, A. L.: Action of Oxygen in Counteracting Alcoholic Intoxication, Am. J. Physiol. **107**: 610 (March) 1934.

5. Hunter, F. T., and Mudd, S. G.: Carbon Dioxide Treatment in Acute Alcoholism, Boston M. & S. J. **190**: 971 (June 5) 1924.

6. Cannan, R. K., and Sulzer, R.: Estimation of Alcohol in Blood, Heart **11**: 148 (April) 1924. Newman, H. W.: The Determination of Ethyl Alcohol in Body Fluids, J. Pharmacol. & Exper. Therap., to be published.

dioxide-oxygen inhalation than before. The results of the procedure in the three dogs used are given in the accompanying table, in which it may be seen that in each case the increased rate of decline of blood alcohol is followed by a period in which there is little if any fall, after which the rate again returns to one comparable to that before inhalation was begun.



Curve of blood alcohol against time after the injection of 2 cc. of ethyl alcohol per kilogram in man, showing increased rate of fall during carbon dioxide-oxygen inhalation, with compensatory rise following.

The significant fact obtained from this experimentation is that there is no actually significant change in the rate of decrease of total body alcohol brought about by the inhalation of the carbon dioxide-oxygen mixture for a period of a half hour. True, there is an acceleration of the decrease of venous blood alcohol during the period of inhalation; but this is compensated for by a subsequent period during which the blood alcohol declines slowly or even rises, so that the fundamental rate of decrease is not appreciably affected. The explanation of this is simple. During the period of inhalation there is, to be sure, an increase in the amount of alcohol eliminated in the breath, which measurably decreases the amount of alcohol in the blood stream, accounting for the more rapid decrease in blood alcohol observed. This decrease is not, however, immediately participated in by the tissues, which hold the great bulk of the total body alcohol, since it has been shown that a considerable period is required for equilibration of alcohol between the blood and the body tissues.[7] Subsequently, when the respiratory elimination has fallen to normal after the inhalation has been discontinued, equilibrium is again established by movement of alcohol from the tissues into the alcohol-depleted blood, accounting for the period of decreased rate of fall or even rise of blood alcohol.

The fact remains that in order for even the blood, if not the body tissue, alcohol to accelerate its rate of decline there must be some increased elimination of alcohol through the lungs. An accurate appraisal of the magnitude of this increase may be arrived at if one knows the alcohol content of the expired air and its volume. The minute volume of respiration in our two human subjects changed, on an average for the two, from 6.5 liters to 35.5 liters, or over fivefold. This is an increase of 29 liters per minute, or 870 liters for the half-hour period of the inhalation. Now it has been shown that a liter of expired air contains from one fourth to one half as much alcohol as a cubic centimeter of blood taken at the same time.[8] The average blood alcohol value in our subjects over the period of inhalation was 1.6 mg. per hundred cubic centimeters, so that the content of their breath must have been from 0.4 to 0.8 mg. per liter. Multiplying the higher figure by the number of liters of increased respiration during the inhalation period gives 0.696 Gm. of alcohol as the amount by which the total body alcohol has been reduced by the treatment. When one considers that this is less than 1 per cent of the total body alcohol at that time, it is readily seen that the decrease could hardly be called significant.

It is not our purpose in this paper to discuss the efficacy of such a mixture of gases in effecting clinical improvement in cases of severe alcoholic intoxication, in which much of the danger lies in depression of the medullary centers, among them the respiratory center, which is subject to stimulation by carbon dioxide. Indeed, there may be even other factors operating, as evidence the remarkable effect of carbon dioxide inhalation in catatonic stupor. Nevertheless, it has been conclusively shown that whatever improvement takes place cannot be accounted for by a reduction of total body alcohol, reduction of venous blood alcohol notwithstanding.

CONCLUSION

The inhalation of carbon dioxide 10 per cent and oxygen 90 per cent for a period of thirty minutes is not effective in significantly reducing the total body alcohol.

Clay and Webster streets.

7. Haggard, H. W., and Greenberg, L. A.: Studies in the Absorption, Distribution and Elimination of Ethyl Alcohol, J. Pharmacol. & Exper. Therap. **52**: 150 (Oct.) 1934.

8. Haggard and Greenberg.[7] Smith, Sydney, and Stewart, C. P., Diagnosis of Drunkenness from the Excretion of Alcohol, Brit. M. J. **1**: 87 (Jan. 16) 1932.

EXTRANEOUS SHADOWS COMPLICATING UROGRAPHY

WITH SPECIAL REFERENCE TO RADIOPAQUE PILLS

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The roentgen diagnosis of intra-abdominal pathologic conditions is difficult largely because of the many organs contained within the abdomen. When their shadows can be distinguished, the single roentgenogram necessarily presents them with more or less overlapping of outlines. If the pathologic process suspected expresses itself in calcifications, it is often difficult to localize these as being in a particular organ.

This situation is especially trying in urologic conditions, in which concretions play a leading rôle and the area traversed by the involved tract is extensive. While urinary concretions may be fairly characteristic, they are not always so and may be hard to differentiate from calcifications in nearby structures. Also, there may occur extraneous densities, of more or less accidental origin, to confuse the picture further.

From the fairly extensive literature on the subject, Holmes and Ruggles [1] have gathered the following list of densities that may simulate renal concretions: 1.

From the Department of Radiology, University of Illinois, College of Medicine.

1. Holmes, G. W., and Ruggles, H. E.: Roentgen Interpretation, ed. 3, Philadelphia, Lea & Febiger, 1926, pp. 285-286.

Those shadows due to material in the bowel, such as fecal masses, enteroliths, fruit pits, opaque salts, such as bismuth and barium (especially residues in diverticula of the colon), pills of ferrous carbonate and phenyl salicylate capsules. 2. Foreign bodies or enteroliths in the appendix. 3. Gallstones. 4. Calcified glands. 5. Tuberculous foci in the kidneys. 6. Calcified tumor masses in the pancreas or in contiguous structures. 7. Increased density of the tip of a transverse process. 8. Small areas of density in the spleen. 9. Calcification in a blood clot or surrounding a foreign body (including the ever troublesome phlebolith). 10. Shadows from fibromas, scars or dressings. 11. Artefacts present in the film or screen.

Fig. 1 (case 1).—Retrograde pyelogram showing opaque pills in close proximity to contrast medium.

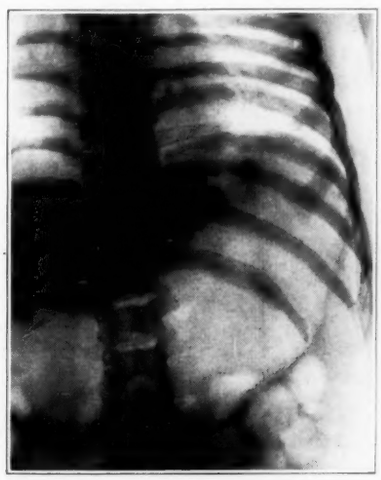

Fig. 2 (case 2).—Anteroposterior film showing one opaque pill in lower part of esophagus and other opaque pills in the cardiac end of the stomach.

Case [2] calls attention to the shadows cast by warts, and Young [3] found that articles of clothing coming into the field may be confusing.

Within the last two years at the University of Illinois Research and Educational Hospitals, we have seen a number of urologic cases presenting localized dense shadows which shifted, disappeared and reappeared in a startling manner.

Case 1.—One of the first and most vexing cases was that of H. R., a woman, aged 28, who entered the hospital Feb. 15, 1934. She had had a right-sided pyelitis performed in 1931, which had cleared up quickly, and there had been no exacerbation during a subsequent full term pregnancy.

Six weeks prior to her admission to the hospital she had suffered a chill, followed by a fever up to 104 F., and had developed an aching sensation in the right loin, present only when standing. There was no radiation of the pain and only slight kidney tenderness. There was no dysuria nor frequency, although some pus was found in the urine. She had had an appendectomy and right oophorectomy.

The plain film of the urinary tract showed a localized round dense shadow to the left of the second lumbar vertebra and an oval one to the right at the same level. A right-sided retrograde pyelogram was attempted. The film showed no densities. The right ureteral catheter curved back opposite the second lumbar vertebra and the opaque solution ran into the bladder. A subsequent intravenous pyelogram showed a right-sided pyelectasis. On the left side there was distortion of the pelvic outline and an apparent filling irregularity with two localized accumulations of what was taken to be opaque urine in the parenchymal region. The observations were considered consistent with a pyelectasis of the right side and a pyonephritis on the left side. Two days later a left-sided retrograde pyelogram was made and again the two localized densities were seen on that side. The outlined left kidney pelvis, however, showed only questionable dilatation and the opaque fluid did not extend to the localized densities (fig. 1). Exploration of the right kidney showed a localized mass in the upper pole, and a kink at the ureteropelvic junction. Sections of a biopsy specimen showed what looked like an old infarct or carbuncle.

Case 2.—Soon afterward we examined C. H., a boy, aged 4, who had been under treatment at the hospital several months for a Pott's disease of the third lumbar vertebra. He was sent to us with the history of a recurrent B. coli urinary infection of several months' duration. Recently organisms suspected of being tubercle bacilli had been found in the urine. The films taken after the injection of skiodan showed a localized density superimposed on the twelfth rib on the right side which had to be considered as a possible calculus. On the left side were seen two round dense shadows at about the level of the twelfth dorsal vertebra, of doubtful origin. Check-up films showed no dense shadows, but they reappeared at a subsequent examination.

Case 3.—J. S., a woman, aged 51, was referred for a film of the urinary tract because of pain on the right side. The film taken (fig. 3) showed two radiodensities in the left kidney region which may have represented urinary concretions. A second film (fig. 4) was taken a few minutes later for a technical experiment and to our surprise this film failed to show the presence of any densities.

Questioning brought forth the information that the patient had ingested several enteric coated ammonium chloride pills shortly before the first film was taken.

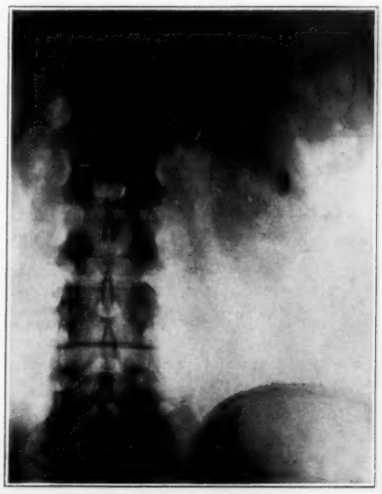

Fig. 3 (case 3).—Left kidney area showing localized densities that simulate concretions.

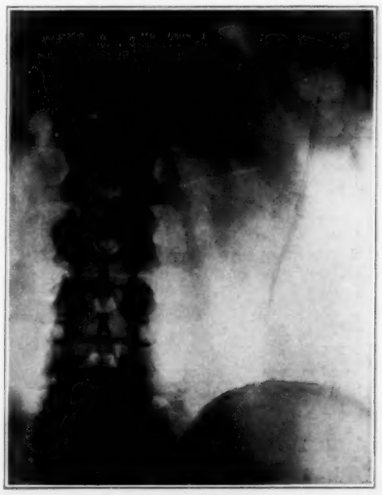

Fig. 4 (case 3).—Left kidney area a few minutes later (film taken for technical experiment): densities no longer visible.

The similarity of the appearance and behavior of the shadows seen in these and other cases led to a review of their medical management for a possible explanation of their source.

The only medicinal agents that the patients who were examined had been receiving were ammonium chloride and sodium acid phosphate, drugs which in recent years have become the usual means of influencing the p_H

2. Case, J. T.: Am. J. Roentgenol. **3**: 333 (June) 1916.
3. Young, J. S.: J. Missouri M. A. **13**: 502 (Oct.) 1916.

of the urine.[4] Under fluoroscopic guidance, therefore, we administered pills of these substances to the second patient and were surprised to note the dense shadow cast by the ammonium chloride (fig. 2). The sodium acid phosphate was faintly visible and then faded while still in the stomach. The ammonium chloride, being enteric coated, maintained its density while in the stomach and often took many hours to dissolve after passing the pylorus. Recently, Bukey and Drew [5] have shown that the average emptying time of enteric coated pills from the stomach is almost six hours, although most of them pass out in four hours. The dissolving time of the coating depends on its composition and thickness and some coatings are so efficient as to pass through the entire digestive tract undissolved.[6] Thus while traversing the alimentary canal it may several times be in a position where it would be superimposed on the urinary tract.

Hull [7] has outlined the fundamentals that govern the roentgen absorptive power of any substance and has evolved a formula to determine the amount of such absorption. Briefly stated, this absorption or shadowing is about in proportion to the cube of the atomic number of the substance multiplied by its density. Menville,[8] working with metallic salts, found, however, that when certain substances are combined the resulting density is not always what one would expect by simply adding the absorption indexes of the two substances. This variation may be in either direction and conforms to our experience.

With a view toward determining the absorptive capacity of other pills, we took at random thirty-three pills and tablets of the commonly used drugs and exposed them alongside a graduated aluminum scale to observe their relative densities (fig. 5). It will be noted that sodium bromide, 10 grains (0.65 Gm.), and triple bromide, 15 grains (1 Gm.), 8 and 9 respectively in the top row, are the densest. Menville found their shadows much denser than their rating according to formula. Using Menville's figures, which are based on beryllium as 1, the density rating of ammonium chloride, 5 grains (0.3 Gm.), uncoated, 1 in the first row, is 64.98. Its shadow is denser, however, than that of 6 in the third row, sodium biphosphate, 5 grains, the rating of which is 102.31. The shadow of ammonium chloride, 7½ grains (0.5 Gm.), enteric coated, 2 in the first row, is disproportionately dense even in comparison with the smaller uncoated tablet next to it This is probably because the enteric coating on this pill consists mainly of a resin to which is added a certain amount of calcium carbonate, a rather radiopaque substance. Its density will also be seen to be much greater than that of pill of ferrous carbonate, 5 grains, 5 in the first row, which has been often quoted as a confusing shadow.

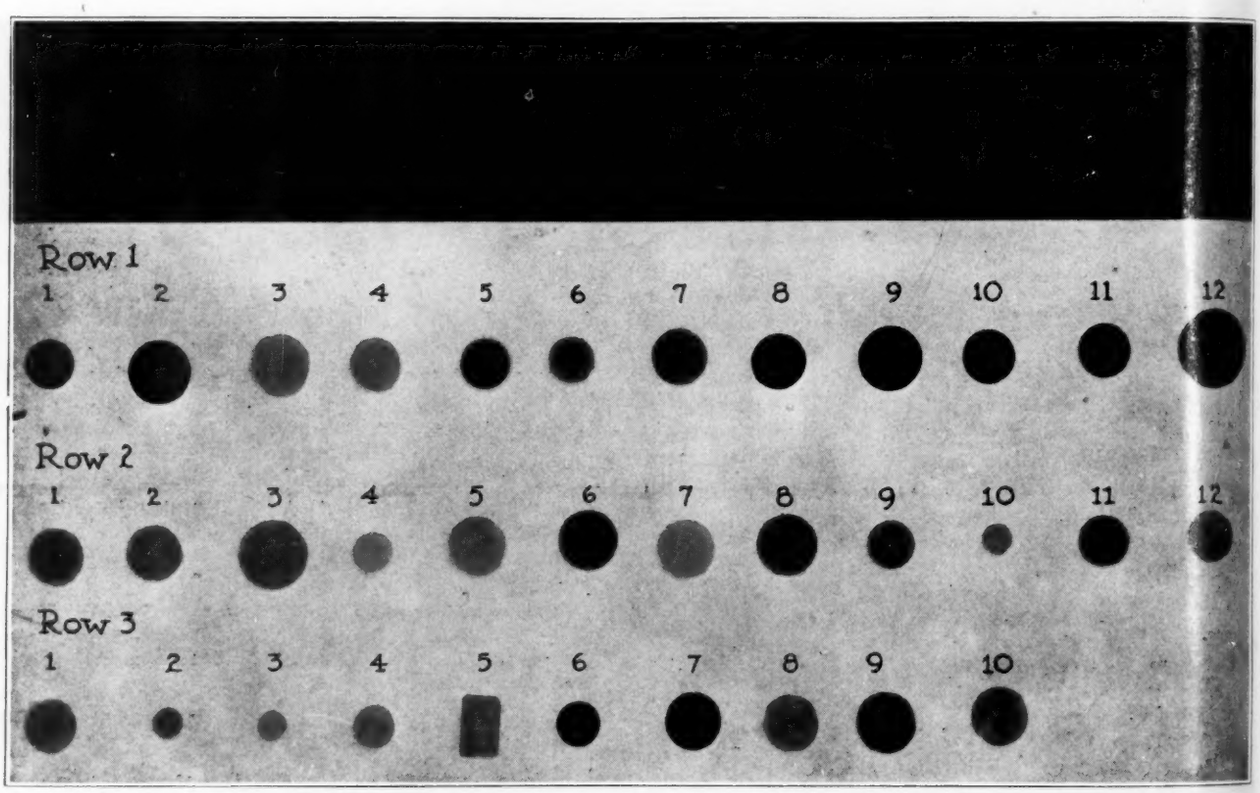

Fig. 5.—Row 1: 1. Ammonium chloride, 5 grains (0.3 Gm.), no coating. 2. Ammonium chloride, 7½ grains (0.5 Gm.), enteric coated. 3. Acetphenetidin, 5 grains. 4. Acetylsalicylic acid, 5 grains. 5. Mass of ferrous carbonate, 5 grains. 6. Sodium bicarbonate, 5 grains. 7. Sodium bicarbonate, 10 grains (0.65 Gm.). 8. Sodium bromide, 10 grains. 9. Triple bromide, 15 grains (1 Gm.). 10. Compound cathartic, enteric coated. 11. Calcium lactate, 5 grains. 12. Calcium lactate, 10 grains. Row 2: 1. Extract of cascara, 5 grains. 2. Cinchophen, 5 grains. 3. Cinchophen, 7½ grains. 4. Digifolin. 5. Neocinchophen, 5 grains. 6. Methenamine, 5 grains; sodium acid phosphate, 5 grains. 7. Methenamine, 5 grains. 8. Methenamine, 5 grains; sodium acid phosphate, 5 grains. 9. Nephritin, 5 grains. 10. Glyceryl trinitrate 1/150 grain (0.0004 Gm.). 11. Ovarian extract, 5 grains. 12. Ovarian extract, 2 grains. Row 3: 1. Ovarian extract; corpus luteum extract; thyroid extract. 2. Parathyroid extract, 1/10 grain (0.006 Gm.). 3. Phenobarbital, ¼ grain (0.016 Gm.). 4. Phenobarbital, 1½ grains (0.1 Gm.). 5. Phenolphthalein, 1 grain (0.065 Gm.). 6. Sodium acid phosphate, 5 grains. 7. Sodium acid phosphate, 10 grains. 8. Aminopyrine, 5 grains. 9. Sodium salicylate, 10 grains. 10. Thyroid extract, 2 grains. The graduated scale at the top consists of twenty steps of aluminum, each step being 1 mm. thick.

4. Herrold, R. D., and Ewert, E. E.: Bol. Asoc. Méd. de Puerto Rico **25**: 6-9 (Jan.) 1933.
5. Bukey, F. S., and Drew, Marjorie: J. Am. Pharm. A. **23**: 1217 (Dec.) 1924.
6. Bukey, F. S.: Personal communication to the authors.
7. Hull, A. W.: J. Radiol. **1**: 27 (Jan.) 1920.
8. Menville, L. J.: Radiology **3**: 118 (Aug.) 1924.

THE RADIOLOGIC INVESTIGATION OF THE SUPERIOR MAXILLARY ANTRUM

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Since the advent of iodized poppy-seed oil little of value has been added to our knowledge of diseases of the accessory nasal sinuses to facilitate radiographic diagnosis. The trend in many quarters has been away from the use of so-called plain x-ray films in favor of the employment of opaque mediums. While holding no brief for either method to the exclusion of the other, I believe that the time may be opportune for a survey of the major diagnostic criteria afforded by plain sinus films. An estimate of the accuracy of the method is attempted as checked by the results in 296 patients on whom the radical antrum operation has recently been performed.

The frequency of infection of the maxillary antrums in sinus disease—variously estimated as occurring in from 75 to 90 per cent of all sinus infections, and the difficulty that may exist in its clinical demonstration in chronic forms—lends to the radiologic examination of the antrums a special importance. Infection of the antrum may be sufficiently obvious at clinical examination and may require only confirmation or evidence as to character and extent. It is, however, a matter of everyday observation that so-called chronic maxillary sinusitis or even repeated subacute infections may fail to cause local symptoms and may remain unsuspected, even though productive of systemic disturbances from direct absorption of toxins or by secondary infections in the joints, the chest or elsewhere. There may be no nasal discharge, though postnasal dropping and repeated head colds are the usual accompaniments of the disease. Transillumination, as has been definitely proved, may be negative even in the presence of an antrum full of mucoid material or polyps. This phenomenon is apparently due to the ability of certain substances to refract light normally. Indeed, the antrum may be more brightly illuminated on the diseased than on the normal side, probably because of coincident decalcification of its walls. Further, an old healed infection cannot be distinguished by transillumination from one that is recent and active.

Pathologic processes of inflammatory type within the antrum manifest themselves in several ways: by production of pus, by thickening of the mucoperiosteum, by polypoid degeneration or cyst formation and by reactive changes in the bony walls. These processes may be identified with considerable accuracy in "plain" x-ray films. The use of iodized oils is rarely necessary and may completely obscure a valuable indication of disease, the condensing osteitis seen in cases of chronic suppuration and the rarefying type commonly associated with chronic polypoid degeneration of the mucous membrane.

The radiologic examination of the maxillary antrum is seldom necessary in the presence of an acute infection. Initially there is a slight decrease in brilliance of all the sinuses, often occurring first in the ethmoidal cells, an appearance much like that seen in allergic individuals in the ragweed season. Such an acute infection may clear up with little or no residual change or may go on to pus formation. In the latter event if drainage is free one may find only a thickened mucous membrane. The thickening may be such as to be barely visible or may almost entirely fill the antrum cavity. The normal mucous membrane, it will be recalled, is not demonstrable in a roentgenogram. If drainage is completely blocked an empyema of the antrum occurs, and a more or less uniformly dense shadow is produced which almost obliterates the superimposed skull markings, as the shadow of the foramen rotundum and the sphenoidal fissure. If drainage is incomplete or is accomplished intermittently by blowing the nose or by postural means, the antrum may be partially filled with exudate, with air overlying. On examination of the patient in the prone position a diffuse haziness is seen and the radiologist may find it difficult to differentiate between pus and polyps. The distinction may sometimes be made with certainty by examination in the erect position, in which a fluid surface, usually concave superiorly, and with air above, may be visible. When the pus is tenacious and small in quantity or when both pus and polyps are present, a fluid line may be absent, but an increased cloudiness in the region of the inferior angle will be observed in many cases when films made in the prone position are compared with others made in the erect. Even when the prone position is used, however, reactive changes in the antral walls should provide a clue as to the presence of pus. A slight increase of bone density is evident even early in the development of empyema and before the actual osteitic condensation of the chronic infection has occurred, as the result of congestion in the vascular and lymph channels and marrow spaces. Furthermore, one must at times rely on its presence as the sole means of differentiating between empyema and retention cyst entirely filling the sinus, or between an antrum containing polyps and one that harbors both polyps and pus. In chronic suppuration the marked degree of condensing osteitis is typical of the condition. It involves the walls of the antrum which are thickened by new bone formation, with inflammatory reaction often apparent also in the malar bone and floor of the orbit. In some cases of chronic suppurative pansinusitis the orbit may be the seat of a condensing osteitis and may appear actually chalky in a roentgenogram without there being any clinical evidence of an inflammatory process in the soft tissues of the orbit. The amount of bony reaction in the antral walls may quite obliterate their outline in a roentgenogram. The location of the reaction in bone is proved both by the fact that it often spreads beyond the actual limits of the antrum and by the observation that little decrease in density follows until long after removal of the contained pus or mucous membrane. At operation the bone is hard and pitted, the mucoperiosteum is often adherent, and the bone bleeds more than is usual.

After drainage has been accomplished in cases of empyema of the antrums, the exact thickness of the mucous membrane may be seen by contrast with the admitted air. While the point is questioned by some observers, I believe that the recognition of even slight mucous membrane thickening over all or part of the antrum may be most important in the search for focal infection when the antrum is seen in a quiescent period between recurring attacks. Mucosal thickening is perhaps most easily demonstrated along the antronasal wall, which is seen almost in contour in postero-anterior films. The outer angle and posterior wall of the maxillary antrum are seen to good advantage in the axial projection, which in many instances also pro-

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vides an excellent demonstration of partitions within the antrum. Such partitions may, if complete, produce what is in effect a double cavity, one or both divisions of which may be infected. The septums usually extend from side to side but may run ventrodorsally, producing an inner and an outer division.

Localized areas of hyperplasia may be detected, occurring frequently in or close to the superior angle. A triangular shadow often occupies this angle in the nose-chin position, simulating regional hypertrophy. It is due to the shadow of the soft tissues of the nose. Localized mucous membrane thickening over the floor or more widespread changes are sometimes seen to be associated with infections at the apexes of such teeth as may lie beneath the antrum floor, the most constantly related teeth being the molars. When the antrum is small, the first molar may be omitted from the relationship.

Fig. 1.—Small root fragment, thrust into the antrum cavity during curettage of tooth socket, resulting in a maxillary sinus suppuration.

Infections of dental origin have been observed to occur most frequently in the wake of tooth extraction with curettage of the socket and consequent removal of the protective zone of inflammatory reaction around infected roots, resulting in spread of the infection to the antrum. At times also the antrum floor is actually perforated by the curet and infected material thrust within. Figure 1 shows a root fragment which gained access to the antrum in that way. The pus formed in such cases is of a peculiar foul character which may be identified by the rhinologist at the time of antrum puncture.

Polypoid or cystic change results in mottled or homogeneous decrease in brilliancy producing a dull slatelike image of the diseased area, yet with normal bone detail elsewhere. Such conditions may be differentiated from suppurative processes, as previously remarked, by lack of productive reaction in bone. They do, on the contrary, produce a rarefying osteitis unless accompanied by a chronic suppuration. Polyps and cysts may be outlined most often toward the floor.

ARTEFACTS

Extraneous shadows superimposed on that of the antrum may give rise to errors of diagnosis. They may be caused by bony structures or soft tissues. Not uncommonly, inequalities of density in the superimposed shadow of the occipital bone will produce cloudiness of one side, which, however, may change in appearance in the nose-chin and nose-forehead positions and can in any event be identified by stereoscopic study. At times a small asymmetrically developed antrum is seen with dense walls, which may be recognized as anatomically thick by lack of osteitic reaction in the adjacent structures, though the condition is usually apparent.

An appearance suggesting heaping up of the mucoperiosteum may be observed at the floor of the antrum in postero-anterior films in patients having unerupted teeth in the distal part of the upper jaw. Other shadows, such as those produced by the petrous bone in poorly made films, need scarcely be mentioned here.

A more deceptive appearance is sometimes caused by an outward bulging of the antronasal wall, which at times may simulate mucosal thickening.

Soft tissue shadows, which may resemble mucosal hyperplasias, may be caused by thick lips, producing a faint crescentic density inferiorly, or by broadening of the soft structures of the nose from pressure in the Waters position, causing a small triangular shadow in the superior angle.

Of far greater importance, however, is faulty technic, which may give rise to misleading appearances with burning out of mucous membrane and other detail in dense contrasty films, while in underexposed roentgenograms the bony walls tend to obscure the lighter shadows.

It may be in order at this point to observe that not every apparent error reported by the rhinologist is actual. It may require only one blowing of the nose to empty an antrum of pus, while the factor of time must also be taken into account. Mucosal thickening of 4 mm. has been seen in the antrum of an allergic patient, while on reexamination, ten days later, the lining membrane was barely visible. The reverse may also occur, and in either case a surgical procedure based only on such evidence, without adequate clinical investigation, is apt to prove disconcerting. A somewhat similar experience has at times been reported when a cyst has been ruptured during antrum irrigation. Such structures may be readily mistaken for and reported as polyps, and their absence subsequently at operation may be mystifying to a degree. The demonstration of chronicity in a lesion, therefore, as indicated by multiple polyps or more particularly by rarefying or condensing osteitis, is the sole guaranty that the condition found by the surgeon will be essentially that described by the radiologist.

Fig. 2.—Overgrowth of bone involving the walls of the maxillary antrum, showing microscopically structure reported as osteomatous in character.

Malignant neoplasms involving the antrum may infrequently originate in the bony walls but are usually found to be carcinomas arising from the mucous membrane. Their differential diagnosis is of course usually impossible radiologically and even the diagnosis of malignancy is difficult or impossible in the early stages on account of the suppurative process which is an almost constant accompaniment of the disease at the stage at which the patient is usually seen. In favorable cases stereoscopic study in two directions may establish the diagnosis, especially in my experience, if

the antronasal wall is involved. It has been found that inferosuperior or supero-inferior projections have been definitely helpful. At times the neoplasm, after eroding the nasal wall of the antrum, will occupy the nasal space and while eroding the bony septum will cause pressure on it with resulting displacement.

Benign overgrowth of bone of osteomatous character is occasionally encountered. Sometimes, as illustrated in figure 2, the hyperplasia extends over an area of such size as to suggest Paget's disease, in which, however, more detailed bone study usually shows the variations of texture, often with small islets of condensation, typical of the disease. Dental films of the alveolar process may be found of definite value.

Omission of mention of the postoperative appearance of the antrum has been intentional. The intense reaction set up by radical operative procedures entirely masks the antrum cavity and contents, closely resembling the condensing osteitis of chronic suppuration, though at times presenting a more marbled effect. The clinical record, which should accompany each patient referred for roentgen examination, should indicate the nature and date of any operative procedures that may have been carried out.

CORRELATION OF ROENTGEN AND OPERATIVE OBSERVATIONS

In 100 cases, chronic maxillary sinusitis with more or less well marked mucosal thickening was the major finding reported. In 127 cases the diagnosis was confirmed. In eighteen cases of the 127, polyps of small size were found at operation which had not been seen roentgenographically. Three cases considered acute by roentgen examination were found to be of chronic type.

Of 196 cases polypoid degeneration was reported as the outstanding feature and with subsequent operative confirmation. Four antrums in which polyps were reported were found to contain cysts. Of the 102 remaining, in two instances pus was reported to be present in quantity and was not evident to the surgeon, in four pus in quantity was found and had not been reported; in two cases polyps of a centimeter or more in diameter were removed when only mucosal thickenings had been reported.

Thirty-eight cases were described as showing evidence of barely demonstrable osteitic reaction, with no definite mucosal thickening, pus or polyps present. They were considered as representing residual changes from an old infection not active at the time of examination.

Of this group six contained one or more very small polyps, not visible preoperatively or on reexamination of the films.

In twenty-two cases, frank empyema was reported and confirmed at operation. Of these, ten were reported by the surgeon to have contained polyps, the presence of which was entirely masked in the roentgenograms by the contained pus.

The difficulties in the way of an estimate of accuracy of this kind are appreciated. The various groups overlap, while osteitic reaction of various degrees runs through the entire series. The presence of small amounts of pus was also a frequent finding. Further, errors made on the side of missed lesions are less apt to be uncovered, the surgeon being doubtless sometimes deterred from operation by reason of a negative roentgen report. Nevertheless, a survey of the tabulated results of these cases indicates that the radiologic diagnosis of chronic maxillary sinusitis made on "plain" x-ray films was essentially correct in almost every instance. I believe that the presence of polyps in an antrum containing definite mucosal thickening, especially if an osteitic reaction is present, does not materially alter the clinical conduct of the case. In the thirty-eight cases of the 296 described as representing the end result of an old healed infection, this may not apply. They form the borderline group, and it will be seen that, while definite evidence of disease was not lacking, a detailed description of the pathologic changes present was not accurate in six of thirty-eight antrums examined. In this group only a slight haziness was observed radiologically over the suspected antrum, with no definite pus or polyp formation evident. The periosteum in several instances was apparently thickened, while at operation the mucous membrane was found to be adherent; the bone bled readily and was hard to the curet. I feel that the knowledge of the presence of even slight polypoid degeneration of the mucosa might influence treatment in such cases as indicating the probability of reinfection when healing was considered to have occurred. At present, therefore, I am studying the ethmoidal cells closely for a clue as to similar change occurring in that area, where it is more readily demonstrable. I believe that if doubt still exists an opaque medium may well be used to fill the antrum, by whatever method is preferred by the operator. The preliminary plain films will then establish the presence of minimal osteitic reaction; the iodized oil may reveal the slight associated polypoid degeneration of the mucous membrane.

ABSTRACT OF DISCUSSION

DR. FREDERICK M. LAW, New York: I have just returned from a large gathering of otorhinologists in Toronto. In talking with these doctors I found a great number of well known men who do not rely on interpretations of roentgenograms of the sinuses. It has been about thirteen years since attention was first called to the changes in the bony walls as a means for diagnosis, but it is surprising how many reports are submitted to me in which the diagnosis is made simply on the opacity or cloudiness of the sinuses, and there the reports end. This is the kind of report which those doubting Thomases have received. It does not contain the information the surgeon desires. What he wants to know is the character of the contents of the sinuses, the quality of the bony walls and what are the anatomic difficulties which he may encounter in operating. These are facts which are evident when one looks at a perfectly made set of sinus films. Just as Dr. Shannon has pointed out, there is a definite change in the characteristics of the bony walls of the sinuses in which disease exists, and the omission of such information can be laid to carelessness or ignorance on the part of the interpreter. There are technical errors of which the rhinologist is not aware and with which radiologists are familiar, thus showing the absolute necessity of cooperation and consultation. Allergy produces the greatest difficulty. As demonstrated in a case recently, a relative of mine is peculiarly allergic to watermelon. I made a set of sinus roentgenograms and they were perfectly clear. Then I gave her a piece of watermelon and in thirty minutes made another set, which were four plus positive sinuses. This shows the necessity for a history. If one would refuse to make a roentgenogram until one has the clinical data, that error might be minimized.

Not Necessarily Spinach.—Please note that "green vegetables" need not mean spinach. Spinach is by no means in a class by itself as a vegetable rich in vitamin A value. In tests thus far available escarole, kale and parsley have shown higher vitamin A values than spinach; other dark green leaf vegetables such as beet greens, chard, dandelion and turnip tops rank about with spinach in this respect. (It is time for the science of nutrition to throw off the incubus of too close an identification with spinach!)—Sherman, H. C.: Food and Health, New York, Macmillan Company, 1934.

INTRAVENOUS AND RETROGRADE UROGRAPHY

A COMPARATIVE STUDY

R. E. CUMMING, M.D.
AND
G. E. CHITTENDEN, M.D.
DETROIT

Urology stands on two sturdy supporting limbs: the instruments for precisive visual diagnosis, of which the cystoscope is the foundation stone, and urography. Because of accuracy in diagnosis and the controlling power throughout the course of most maladies of the urinary tract, afforded by their regular adaptation, an unpretentious specialty has risen to a very high plane in little more than one human generation. Nearly thirty years ago, the roentgen ray was made immeasurably valuable in the study of urogenital lesions by the successful practice of pyelography, while prior to that time some of the most spectacular films or plates for public and professional demonstration of the virtues and possibilities of the x-rays were those depicting images of stone in the urinary tract.

Lower and Nichols [1] state that perhaps in no other field of medicine and surgery has the roentgenogram been of more signal value than in the diagnosis of diseases of the urinary tract but that nevertheless it is absolutely essential for the clinical diagnosis and the roentgen examination to be considered together in any given case. As pointed out by Young and Waters,[2] the work of the cystoscopist was expanded greatly following the regular adoption of pyelographic technic. So likewise an added burden was placed on the roentgenologist, who was forced to learn much of the intimacies of urology in order to be of the greatest assistance possible in the interpretation of plates. The enormous amount of clinical material evaluated by Braasch [3] in the compilation and revision of his work, together with atlases published in conjunction with case histories by the authors already mentioned and others, has proved of equal and inestimable value to the cystoscopist and the roentgenologist.[4] The common practice of publishing roentgenographic prints in textbooks on urology and in many articles on urologic subjects has provided a further wealth of material for all observers.

Since medical progress breeds dissatisfaction with methods at hand, the early solutions for use in filling the lumens of the urinary tract to produce radiopacity have been discarded in favor of several which are less expensive, less toxic and less irritative, allowing better images, and which at present seem to answer all requirements for perfect retrograde mediums. It is interesting that the most acceptable medium today is one of those used for intravenous urography. There have been healthy improvements, therefore, in the method of retrograde urography, another being the frequent use of some pyeloscopic routine. One obvious difference exists in the application of the two methods. Cystoscopic technic and skill are required for one, while any one having access to an x-ray machine can practice the other after a fashion. Therein lies a real danger in intravenous urography, and one aspect of it is the procrastination in serious illness, bred of faulty interpretations.

The development of intravenous urography has again increased the scope of work on the part of both the urologist and the roentgenologist. Taking advantage of urine secretion and adapting urine-bearing drugs to delineate the lumens of the urinary tract, a number of scientists have provided this ingenious method for physiologic investigation and diagnostic study so that now, by dint of research and painstaking application, intravenous urography has been accorded an established rôle in medical diagnosis. For a time, however, it threatened the older method used for roentgenographic study of the kidney and ureter, retrograde urography. Its usurpation was like that of a new toy, and its use rather indiscriminate; it is still depended on by many workers to a degree that we think is absolutely unwarranted.

Without the distinct advantages of the intravenous method, the true motor physiology of the urinary tract cannot be investigated, and even in its present high state of efficiency it leaves much to be desired. The ideal

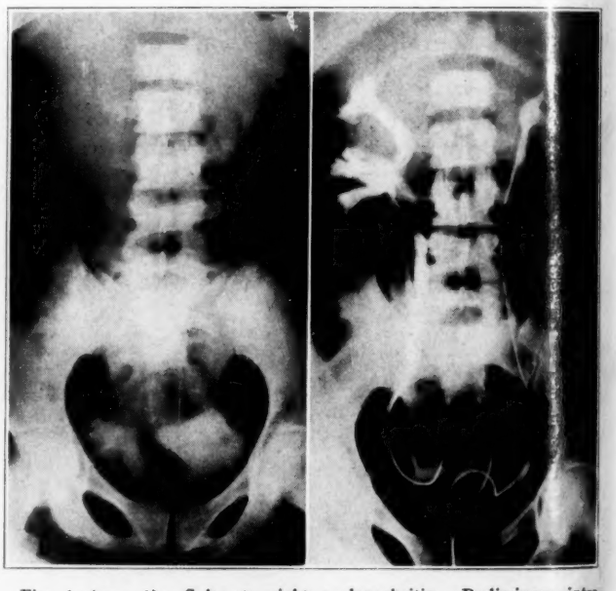

Fig. 1 (case 1).—Subacute right pyelonephritis. Preliminary intravenous urography not productive of any information. Retrograde urography with catheterization of ureters and with catheter in lower pelvis of double kidney (right), readily demonstrated entire anatomic situation.

medium will be one which will so completely and suddenly suffuse the urine that pyeloscopic and serial roentgenographic studies may be regularly made and repeated on individual subjects, with certainty as to clear and complete delineation of the entire lumen, including the minor renal calices and the full extent of the ureters. It is impossible to relate the experiences of those who have published hundreds of articles on the subject of intravenous urography in our own and the foreign literature. All are familiar with the valuable investigations made with the Jarre Ci-nex camera, and it has been a great privilege to collaborate with Jarre in all his urographic studies.[5] An excellent summary dealing with the general aspects of intravenous urog-

Read before the Section on Radiology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 13, 1935.

1. Lower, W. E., and Nichols, B. H.: Roentgenographic Studies of the Urinary System, St. Louis, C. V. Mosby Company, 1933.
2. Young, H. H., and Waters, C. A.: Urological Roentgenology, New York, Paul B. Hoeber, Inc., 1928.
3. Braasch, W. F.: Pyelography, Philadelphia, W. B. Saunders Company, 1928.
4. Roche, A. E.: Pyelography, New York, William Wood & Co., 1929. Woodruff, S. R.: Urographic Urology, New York, Wainick Printing Company, 1931.
5. Cumming, R. E.: Urography, J. Urol. **24**: 587 (Dec.) 1930; Physiologic Data upon Renal and Ureteral Function, ibid. **25**: 613 (June) 1931.

raphy and prepared by one of the pioneer workers in the field is that by Swick.[6]

One may safely predict that the final perfection of mediums for intravenous administration will allow complete visualization of all normal lumens of the urinary tract, thus enabling a final evaluation of physiology in its bearing on the normal movement of the urinary

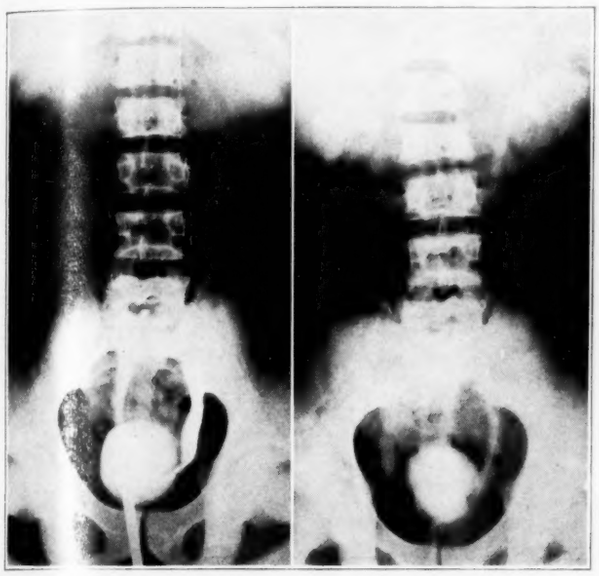

Fig. 2 (case 2).—Bilateral pyelonephritis, bilateral ureteritis and bilateral ureterocele. It was impossible to catheterize the ureters on three occasions, one with spinal anesthesia. With the catheter in the left ureteral orifice an attempt was made to obtain a ureteropyelogram. Intravenous urography readily produced images showing the entire renal pelves, ureters and bladder. Note also peculiar deformity of bladder due to ureteroceles.

stream. Such mediums will not be universaliy diagnostic, however, since deviations in renal and ureteral motor function must of necessity be expected to interfere with proper filling of the lumens. Total or radical renal failure likewise will continue to allow instances of incomplete image production or entire lack of opaque shadows. Perhaps the correct dictum for the present is to the effect that the more normal the kidney and ureter, the less complete are the images obtained, barring radical dysfunction. This statement will not be accepted by many, yet we are convinced that it is true. The very fact that some men adopt special methods for preparation of patients and added details in the progress of an investigation, such as the regular use of low abdominal compression, while others strictly avoid preparation and assert that only one exposure is regularly necessary for a diagnosis, eliminating even a plain preliminary film, points to a wide variation in opinion and proves the continued transition in progress as regards the actual practice of the intravenous method.[7]

It is our purpose to compile an up-to-date estimate of the value of intravenous urography, making comparisons with the well established method of cystoscopic (retrograde) urography and treating the subject from the standpoint of three groups; namely, roentgenologists, urologists and pathologists. To that end we prepared a questionnaire, which was mailed to more than 350 active physicians. We are indebted to them for their excellent cooperation in their returns, which we are sure provide a fair cross-section of belief and experience based on the study of many thousands of clinical cases. The accompanying tables contain an accurate summing up of the personal opinions of a great many outstanding men. While the majority of these are urologists, a considerable list of roentgenologists appears in our file of answered questionnaires, and a survey of the opinions of a number of pathologists made as a separate investigation has furnished the background for conclusions representative of the three groups mentioned.

The inaccuracies current in the practice of retrograde urography are well known, especially to experienced clinicians who are best able, on the other hand, to interpret the many variations in roentgenograms obtained by the intravenous method. Some roentgenologists seem willing to attempt a complete diagnosis of disorders of the urinary tract without the counsel of a clinician. With the two methods of urography in constant and indiscriminate use, it is more than ever necessary to establish a proper alliance between roentgenologists and clinical urologists. The correct balance allows primary choice of either method with a willingness to seek confirmation by means of the other. Many individual problems can be solved by one method; in some situations only one can be used. Taking advantage of both and adding the regular practice of multiple or serial exposures at carefully chosen intervals, one may obtain maximum information. Well known dangers of retrograde urography, which formerly were ignored or accepted as unavoidable, are now largely eliminated, so

TABLE 1.—*Estimated Cases with Intravenous Method*

Estimated number of cases (intravenous method)...	78,250	
	Number	Per Cent
Experience limited (up to 100 cases).....	33	20
More extensive (up to 500 cases).....	94	58
Extensive (up to 1,000 cases).....	25	15
Very extensive (up to 5,000 cases).....	9	5
No answer	3	2
Total	164	100

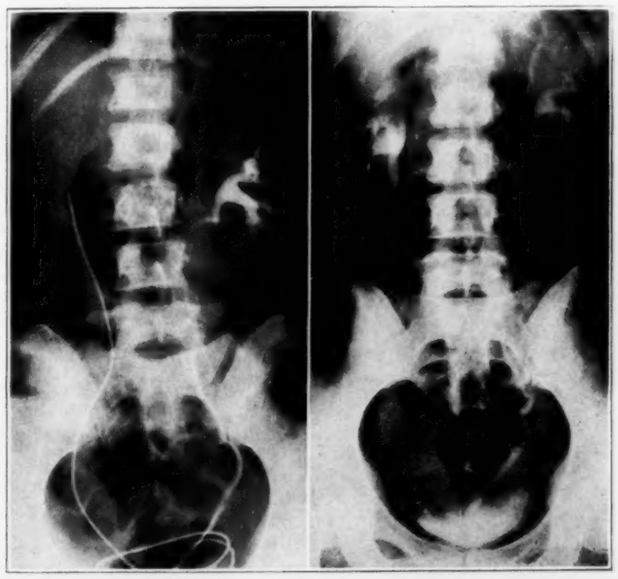

Fig. 3 (case 3).—Left ureterocele with abnormal placement of ureteral orifice and ureteritis in ureter leading to upper pelvis of a double kidney. Repeated cystoscopy and retrograde urography failed to disclose entire pathologic condition but provided an excellent study of the lower pelvis on the left side. Intravenous urography gave an excellent demonstration of the upper pelvis and the entire ureter therefrom, demonstrating very clearly the dilatation and anomalous position of its lower segment.

6. Swick, Moses: Excretion Urography, in Oxford Urologic Surgery, New York, Oxford University Press, 1935, volume 1.

7. (*a*) Swick.[6] (*b*) Wesson, M. B.: Intravenous Urography for the General Practitioner, South. M. J. **28:** 16 (Jan.) 1935.

that justifiable fears as to potential renal damage and extension of infection no longer exist. We have found no evidence of alarm or of serious consequences verified by pathologists, in connection with the use of the various mediums now employed. Elements of danger present in intravenous urography, which still cannot be ignored, will appear in the tables and will bear close scrutiny.

The variety of answers that our questionnaire has evoked makes one waver between the adoption of intravenous urography to the exclusion of the retrograde method and a wholesale condemnation of the intravenous method and regular use of retrograde urography. This great divergence in opinion shows a need for more uniformity in technic, with regard to both methods, and a more consistent pooling of information on an unbiased level. We would hate to be deprived of either method in our own practice and are illustrating our need for both in the accompanying illustrations. Our own experiences in purely clinical practice also are at variance with those of much better observers. For instance, in renal tuberculosis we have rarely found it possible to obtain satisfactory roentgenologic evidence

TABLE 2.—*Comparative Use of Two Methods of Urography*

Intravenous Urography		
1–5%	7	4%
5–25%	95	58%
25–50%	29	18%
50–75%	11	7%
75–100%	15	9%
No answer	7	4%
Total	164	100%
Retrograde Urography		
0–25%	7	4%
25–50%	20	12%
50–75%	32	20%
75–100%	93	57%
No answer	12	7%
Total	164	100%

TABLE 3.—*Percentage of Instances in Which Intravenous Urography Provides Positive Diagnosis and Confirmatory Diagnosis*

	Positive Diagnosis		Confirmatory Diagnosis	
1–5%	12	7%	0	....
6–15%	60	38%	37	22%
16–30%	26	17%	25	17%
31–45%	12	7%	8	5%
45–60%	17	10%	19	11%
61–75%	7	4%	10	6%
76–90%	12	7%	24	16%
91–100%	0	....	4	2%
Never	9	5%	4	2%
No answer	9	5%	25	17%
Occasional or doubtful	0	....	4	2%
Totals	164	100%	164	100%

with the intravenous method. In early lesions the information is not definite, the finer changes not being brought out in the images on any of a long series of films, while in an advanced process there has rarely been sufficient delineation for any interpretation.[8] Likewise, in the instances of large hydronephrotic kidneys the images obtained by the use of various intravenous mediums have nearly always been incomplete. So, in the two types of disease mentioned, one must have recourse to retrograde studies. Cabot,[9] however, states that the pathologic changes found at operation or post mortem are usually very accurately promised by previous intravenous studies. Many writers have stressed the value (as have several in the questionnaire reports) of intravenous urography in the two specific pathologic conditions named.

Since the discrepancies mentioned exist in the minds of those in daily contact with urologic diagnosis, is it

TABLE 4.—*Major Advantages and Indications of Intravenous Urography*

1. Bilateral function, dynamic and anatomic study
2. Informative studies in:
   (a) Injuries to kidneys, ureters, bladder, urethra
   (b) Calculosis
   (c) Nephroptosis
   (d) Perirenal abscess
   (e) Congenital defects and anomalies
   (f) Obstructive lesions (at any situation)
   (g) Ureteral transplants
   (h) Differential diagnosis from abdominal conditions
   (i) Urinary tract tuberculosis
   (j) Hydronephrosis
   (k) Pyelonephritis of pregnancy
3. Avoidance of cystoscopy, because of:
   (a) Difficulty or inability to do cystoscopy (urethral or ureteral obstructions)
   (b) Pain
   (c) Severe infection
4. Routine studies in prostatic hypertrophy
5. Children

TABLE 5.—*Minor Advantages and Indications of Intravenous Urography*

1. Preliminary study to cystoscopy
2. Comparative simplicity in technic (but more difficult of diagnosis)
3. Kidney outlines enhanced
4. Avoidance of deformities due to spasm or excessive pressure
5. Less expensive (but will be more so if cystoscopy is necessary)
6. Avoidance of hospitalization as a rule
7. In neurotics or those who refuse cystoscopy
8. Pulmonary tuberculosis
9. Supplemented or confirmatory information
10. Follow-up studies (medical or postoperative)

not dangerous to announce to the general medical public that intravenous urography has brought back to general practitioners a large element of their practice, so that, presumably without help from either urologist or roentgenologist, they may now make a proper diagnosis on most patients with kidney disease?[7b]

The questionnaire with which this presentation is concerned was prepared in order to obtain as accurately as possible the opinions of those most qualified to pass on the comparative values of intravenous and retrograde urography. Obviously, it was not practical to send copies to all the eminent urologists, even those in America, nor to many roentgenologists who, by reason of the volume of their work or a peculiar interest, might well be expected to have valuable data available. The tables were prepared after a most painstaking study of the questionnaires returned. Of the 350 questionnaires distributed, replies were received from 164, representing answers from between 225 and 235 individual physicians.

Table 2 is arranged to show the percentages of comparative usage of the two methods of urography, while table 3 depicts the percentage of instances in which intravenous urography affords (*a*) a positive diagnosis and (*b*) a confirmatory diagnosis.

8. Cumming, R. E.: Intravenous Urography, Radiology **18**: 41 (Jan.) 1932.

9. Reply to questionnaire.

In table 4 are listed the advantages of intravenous urography and its major indications; in table 5 its minor advantages and indications.

Table 6 provides a composite opinion of the disadvantages of intravenous urography and indirectly points out the comparative increased value in those procedures which accompany retrograde urography.

In table 7 are listed the definitely recognized contraindications to intravenous urography. Here again one must keep in mind that the retrograde method has certain dangers which might even be listed as contraindications.

In connection with the collected data relative to low renal function, a number of men have reported using excretory (intravenous) urography in cases presenting a total nonprotein figure of 250 mg. or more, without ill effects. Relative to hyperthyroid states, two cases presenting symptoms exaggerated by intravenous mediums were reported. Since the iodine in both neoiopax and diodrast is so rapidly eliminated in ordinary situations, this complication seems open to doubt, although so-called iodism may play a rôle in such cases. Reference to a presumed danger in intravenous urography in cases of pulmonary tuberculosis, is made in table 7, since it was mentioned in a great many questionnaires. However, some men who are using intravenous urography in large tuberculosis sanatoriums have reported that there is no contraindication, per se, provided by this disease.

TABLE 6.—*Major and Minor Disadvantages of Intravenous Urography*

Major Disadvantages

1. Insufficient diagnostic information due to:
   (a) Insufficient filling of calices or pelvis
   (b) Too rapid elimination
   (c) Complete absence of shadow with normal kidney
   (d) Incomplete information about ureters, bladder
2. No cultural information
3. Intestinal flatus may give misleading films
4. Lack of detail in obese individuals
5. Greater experience needed for interpretation

Minor Disadvantages

1. Technical difficulties (poor veins and other conditions)
2. Used indiscriminately, or by incompetent men
3. Expensive, if retrograde urograms are necessary

TABLE 7.—*Contraindications to Intravenous Urography*

1. Renal
   (a) Low renal function
   (b) Nephritis
   (c) High nitrogen retention
   (d) Nephrosclerosis
   (e) Nephrosis
2. Cardiovascular
   (a) Coronary disease
   (b) Advanced myocarditis
   (c) Decompensated heart conditions
3. Liver
   (a) Liver insufficiency
   (b) Cirrhosis
4. Miscellaneous
   (a) Hyperthyroidism
   (b) Pulmonary tuberculosis
   (c) Allergic states
   (d) Hyperpyrexia

Table 8 lists the fatal complications to intravenous urography. It is difficult to link up the use of any of the standard mediums used with some of the fatalities mentioned, particularly in view of the time elapsing after the x-ray studies were made.

The common reactions to the newer preparations in use for intravenous urography are shown in table 9.

A few more or less technical points which we had hoped would be discussed by those who so obligingly replied to the questionnaires, but which appeared to elicit little interest, include the adaptation of pyeloscopy to urography in general. When mentioned in connection with intravenous urography, it was stated that the images obtained were insufficiently clear and dense to allow good visualization for fluoroscopic study. This is the fact as regards work with the fluoroscopic screen which is attached to our Ci-nex camera, and one of our requirements for advanced studies in motor physiology is a medium which will provide this as yet unaccomplished detail. Another point is that of lateral exposures: it is our belief that much of value can be

TABLE 8.—*Fatal Reactions*

Author	Number of Cases	Comment
A. Ravich.....	1	Chronic nephrosclerosis, three days after use of iopax
C. McDevitt....	1	Woman, aged 59, polycystic kidneys, 6 days, anuria: no visualization
N. Moore.....	1	Cardiovascular collapse, 4 years after intravenous iopax
W. Kearns.....	1	Infant, aged 8 months, cause not stated
E. Belt.....	1	Frail elderly woman in poor condition, unilateral renal tuberculosis; immediate autopsy failed to reveal cause

TABLE 9.—*Common Reactions to Newer Preparations*

(No reactions reported: 109 —66% of 164)

1. Allergic
   (a) Urticarial (25)
   (b) Rhinitis (5)
   (c) Edema of glottis (5)
   (d) Unspecified (5)
   (e) Lacrimation (3)
   (f) "Iodism" (3)
   (g) Nitritoid (2)
   (h) Salivation (1)
2. Thrombosis (0.3% in 5,000 cases—Braasch)
3. Pain (8)
4. Nausea and vomiting (7)
5. Cellulitis (3)
6. Syncope, shock, collapse (7)
7. Temporary anuria (2)
8. "Nervous reactions" (2)

obtained by including one or more films exposed in a lateral or semioblique position in routine studies on the upper urinary tract. This was stressed recently by Mertz.[10] One observer (H. W. Howard [9]) states that a lateral film taken with the suspected kidney the more distant from the film provides excellent data on kidney rotation and ptosis.

In order to provide ample illustrations of the comparative values of intravenous urography and retrograde urography, and particularly in order to illustrate the real need for both methods, the accompanying reproductions of roentgenograms are offered for inspection. In the first instance, a working diagnosis was impossible with intravenous urography, while a retrograde study readily gave a complete anatomic diagnosis. In the second instance, just the reverse was true; while in the third, both methods had to be resorted to for accurate diagnosis.

CONCLUSIONS

1. Many of the inaccuracies of both intravenous and retrograde urography are well known, and the correct balance is purely an individual problem; one must take advantage of both methods and use serial or multiple exposures at carefully chosen intervals to obtain maximum information.

2. One must be constantly reminded of the close harmony necessary between those working in the field of roentgenology and those who practice urology. Not only a mutual knowledge of an entire given clinical

10. Mertz, H. O., and Hamer, H. G.: The Lateral Pyelogram, J. Urol. **31**: 23 (Jan.) 1934.

picture but also joint study of diagnostic indications, especially those afforded by urographic investigations, are important to both groups for the ultimate in diagnosis.

3. Our opinion is that intravenous urography has a definite rôle in the investigation of the urinary tract, although it is quite probable that the ideal medium and technic are still to be worked out.

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ABSTRACT OF DISCUSSION

DR. MOSES SWICK, New York: Like other methods in medicine, excretion urography is not without its limitations. Even cystoscopy and retrograde pyelography, despite their years of existence, still have their defects. Excretion urography cannot supplant cystoscopy, retrograde pyelography and ureteral catheterization. However, one should concede that excretion urography has simplified urologic diagnosis and has eliminated to a certain extent retrograde pyelography, particularly when viewed in conjunction with the history and the physical and laboratory observations. It is simpler and less taxing to subject a patient to an intravenous urographic examination first. When corroborative or supplementary evidence is indicated, or when the results are equivocal, cystoscopy or retrograde pyelography can be carried out. Excretion urography has been of considerable help in the presence of obstructive lesions of congenital origin, or of lesions either obstructive or infectious superimposed on congenitally anomalous conditions, under which circumstances retrograde pyelography may be mechanically impossible or dangerous. As a result, congenital anomalies are being recognized clinically with greater frequency. Children, in whom pyuria has usually been attributed to pyelitis, have been found to be suffering from infections superimposed on congenital lesions, particularly the infected congenital hydronephroses. Concerning the latter, it is important to bear in mind that, despite comparatively little intact renal tissue, good visualization may often be encountered and that therefore intense roentgenologic shadows are no quantitative criterion nor one for determining the type of therapeutic procedure. The latter will depend on the functional-anatomic status of the individual case and on the operative observations. Again, in nonfunctioning hydronephrosis, the mere nonvisualization of a conducting system incidental to the functional-anatomic derangement of the kidney parenchyma is in itself of great assistance as a means of localization and of diagnosis, when considered together with the other clinical data. Excretion urography is well adapted to cases presenting obscure abdominal symptoms and conditions in which one is adverse or hesitates to subject a patient to the retrograde route of investigation. For example, the differentiation of abdominal masses, whether of intra-urinary or extra-urinary origin, has been frequently facilitated by this method of approach. In this fashion, the diagnosis of congenital solitary kidney, ectopic fused kidney and dystopia of the kidney have been most important to the internist, surgeon and urologist. Excretion urography and retrograde pyelography should supplement rather than vie with each other as to superiority.

DR. ROBERT E. CUMMING, Detroit: Roentgenograms that depict both sides of a comparative study and represent investigations made on three consecutive patients seen during recent weeks supply a fair means of indicating the necessity of using both methods of urography in urologic diagnosis. I think it is dangerous for Dr. Swick, or any of us, to select slides that may show wonderful results with one or the other of the two methods, without establishing the value of the two. I believe that in most of Dr. Swick's cases a diagnosis might have been made readily and safely by means of retrograde pyelography. In the three cases mentioned, both methods of making urograms were necessary to complete a diagnosis in one instance, and each method failed once and was successful once. When a questionnaire is returned by an excellent roentgenologist with the statement "I have never been able to make a diagnosis with the intravenous urographic method" and another sent back by a prominent urologist includes the statement "I have seen a number of normal kidneys removed with a diagnosis of tumor made from intravenous urographic study," and when numerous other correspondents advance opposing ideas on various phases of urography and the two methods under consideration, the timeliness of the discussion is most apparent.

HYSTEROGRAPHY AS AN AID IN THE DIAGNOSIS OF ABDOMINAL PREGNANCY

REPORT OF A CASE

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There appear to be in the literature reports of only seven cases in which the injection of iodized oil into the uterine cavity was employed for the purpose of verifying a diagnosis of abdominal pregnancy. The first one to use hysterography for this purpose was Bermann [1] in 1925. The others who employed this procedure were Gabaston and Harguindeguy,[2] Mendenhall,[3] Couvelaire, Portes and Digonnet,[4] Osborn [5] and Nölle.[6] It is true that such gestations are not often encountered and even when present are frequently not suspected. However, when a diagnosis of abdominal pregnancy seems to be the correct one, injection of iodized oil into the uterus is not only a simple and relatively harmless procedure but presents absolute evidence of the presence of a pregnancy outside the uterine cavity. A roentgenogram taken of an abdominal pregnancy without previous injection of an opaque substance into the uterus frequently shows a dead or a live fetus in an abnormal location but it does not prove that the fetus is outside the uterus. A comparison of figure 1 and figure 2 will demonstrate this point.

When a roentgenogram shows a fetus that has a collapsed skull and/or other evidences of fetal death and there is a suspicion of extra-uterine pregnancy, there is surely no harm in injecting iodized oil into the uterine cavity to decide whether or not the fetus is inside or outside the uterus. Likewise in cases in which a fetus is dead and repeated attempts to induce labor by medicinal and mechanical means, such as the introduction of gauze, and bougies, fail to bring about expulsion of the child, it is advisable to perform hysterography. Occasionally one may be surprised to find an abdominal gestation. However, if the child is alive, together with doubt in the diagnosis, it might be dangerous to inject solutions into the uterus.

REPORT OF CASE

Mrs. J. D. was referred to me by Dr. J. B. De Lee with a diagnosis of mature dead fetus outside the uterine cavity. He recommended that a study of the case be made by means of iodized oil. The patient was 31 years old and had a living child 3 years of age. Her last menstrual period had begun on May 13, 1934. On July 14 she experienced the sudden onset of severe cramplike pains in the lower part of the abdomen while attending a funeral. In spite of the pain she walked one and a half blocks to her home. The pain persisted and a physician was called, who administered a hypodermic to relieve the pain. There was no vaginal bleeding at this time.

1. Bermann, quoted by Gabaston and Harguindeguy.[2]
2. Gabaston, J. A., and Harguindeguy, E.: Semana méd. **35**: 1225 (May 17) 1928.
3. Mendenhall, A. M.: J. Indiana M. A. **22**: 349 (Sept.) 1929; Am. J. Surg. **18**: 270 (Nov.) 1932.
4. Couvelaire, Portes and Digonnet: Bull. Soc. d'obst. et de gynéc. **19**: 34 (May) 1930.
5. Osborn, G. R.: Am. J. Obst. & Gynec. **20**: 98 (July) 1930.
6. Nölle, H.: Zentralbl. f. Gynäk. **57**: 683 (March 25) 1933.

However, a few days later there was a slight bloody vaginal discharge and following this there was mild bleeding for a few days every month. During August and September 1934 the patient had severe backache and she vomited considerably. During November and December she had severe pain in the right hip. In December she had albuminuria, hypertension and edema of the hands and feet and in December and January she complained bitterly of "gas pains." She observed that the baby was considerably more active than the one in the previous pregnancy had been.

Labor pains set in on Jan. 14, 1935, and the baby ceased its activity at this time. The patient remained in bed for three days. She was given a number of hypodermics, but the baby was not born. The physician in charge could not hear the baby's heart tones after January 14. Nothing was done following the three days of "labor pains." On February 22 the patient had vaginal bleeding, which was associated with the expulsion of large clots. There was, however, no pain at this time. In March the abdomen was appreciably harder and smaller. On March 26 the patient bled for three days just as though she were not pregnant. On April 9 a roentgenogram showed a dead fetus; hence the physician gave the patient castor oil and quinine in an effort to induce labor. On the three successive days glycerine was inserted into the uterus and pituitary substance was given for the same purpose. These measures proved ineffective. The patient menstruated normally in May and in June.

I saw the patient June 22, at which time she was in excellent health. Her general physical examination was negative and the laboratory examination gave normal results. Abdominal examination revealed a large, hard, smooth, somewhat nodular

Fig. 1.—Appearance without preliminary injection of iodized oil. The fetus lies on one side of the abdomen. The collapsed skull is in the pelvic cavity near the midline. This roentgenogram does not definitely exclude an intra-uterine gestation.

mass, which extended up above the umbilicus in the midline but was much higher up on the left side and in the left flank. No fetal parts could be outlined and no fetal heart sounds could be heard. Vaginal examination revealed a marital outlet and a smooth, hard, closed cervix. In the anterior culdesac was a mass, which was soft and irregular in outline and extended up toward the left side. It appeared to be attached to a small, hard, smooth mass, which lay posteriorly and to the right of it. The latter mass we believed to be the uterus. The irregular mass in front of and to the left of the uterus was considered to be part of the fetal sac containing the dead baby.

An Aschheim-Zondek test proved to be negative. Stereoscopic roentgenograms showed a dead fetus on the left side of the abdomen (fig. 1). On June 24 I injected iodized oil into the uterus and obtained the plate shown in figure 2. As may readily be seen, the uterus is of normal size and both fallopian tubes

Fig. 2.—After the injection of iodized oil. The uterine cavity and both fallopian tubes are readily seen. The fetus occupies exactly the same position as in figure 1, but this picture shows definitely that the fetus is outside the uterus.

are elongated. The right tube passes backward and then curves forward over a rounded soft tissue shadow, which rises to the level of the fourth lumbar vertebra. (At operation this soft tissue was found to be the placenta.) The left tube passes behind the compressed fetal head and oil has collected in large drops apparently in a fluid-containing cavity in the end of the tube. The dead fetus is easy to outline on the left side. The collapsed skull is low down in the pelvis on the left side. There is no doubt whatever that the fetus is outside the uterine cavity.

It was decided to operate but, before doing so, two donors were secured for blood transfusion, should this be necessary. Much trouble was not anticipated, however, because the baby had been dead for five and a half months and it was assumed that the blood vessels in the placental attachment were completely thrombosed. On June 26, thirteen and a half months after the last menstrual period, I operated on the patient. On opening the abdominal cavity I found the omentum completely covering a large, round necrotic-looking mass. The omentum was freed from the mass. Palpation revealed that the mass not only filled the entire lower part of the abdomen but extended about 10 cm. above the umbilicus and well up into the left flank. The left part of the mass contained most of the fetus. The part low down in the midline contained the placenta and the collapsed fetal skull. There were no adhesions between the mass and any abdominal organs except the omentum. The lower pole of the mass was slightly adherent to the uterus, which lay deep in the pelvis behind the fetal sac and over to the right side. The fetus, which was partly macerated, was easily delivered from its sac. The child was a female and presented deformities of the arms and legs resulting from pressure

effects. Examination of the patient's pelvic organs revealed that the left ovary was normal but that the left tube was congested, elongated, markedly dilated and firmly adherent to the pelvic wall on the left side. The right tube was also enormously elongated and coursed over the entire anterior surface of the fetal sac. While the right tube was in contiguity with the sac, it was separated from the latter by the thick wall of the sac. The fetal sac lay entirely on the left side. The placenta was found at the lower pole of the sac and this was slightly adherent to the uterus. The right ovary could not be found anywhere. Both broad ligaments were entirely normal. The fetal sac and placenta were easily separated from the uterus, which was normal in every respect. The right fallopian tube was removed with the mass, as was also a portion of the right broad ligament, to see whether there was any ovarian tissue present in it. The uterus and left tube and ovary were left in situ. The abdomen was closed as usual. Because of the absence of any technical difficulties, the blood lost during the operation was insignificant. The patient made an uneventful recovery and went home twelve days after the operation. She returned

Fig. 3.—Deformed macerated fetus, umbilical cord, placenta and fetal sac.

for an examination on Aug. 16, 1935. She was feeling perfectly well and bimanual examination showed a normal uterus and an apparently normal left tube and ovary. The right fornix was clear. A normal menstrual period had occurred on July 18.

COMMENT

The fetus, sac and placenta are shown in figure 3. The only possible origins for the abdominal pregnancy in this case are as follows: 1. The pregnancy may have been an intra-uterine one and early in gestation the uterus ruptured and the ovum continued to grow in the peritoneal cavity after its expulsion. This is hardly likely as judged from the patient's past history, the normal uterus seen on the roentgenogram and at the time of operation, and the absence of adhesions. 2. The second possibility is that the patient had a tubal pregnancy, probably near the ampulla, and the ovum was extruded into the free peritoneal cavity, where it continued its development. This possibility cannot be ruled out in this case even though both tubes appeared normal except for their size and course. However, the absence of firm adhesions may speak against a tubal origin. 3. The third possibility is an ovarian pregnancy. The diagnosis of ovarian pregnancy is favored because of the following facts:

(*a*) The uterus was entirely normal both on the x-ray plates and on inspection and palpation at the time of operation. There were no scars on it and the only adhesions to it were of the fetal sac, which were slight.

(*b*) Both fallopian tubes were intact for their entire length, which was even greater than normal.

(*c*) Both broad ligaments were entirely normal.

(*d*) A careful search at the time of operation failed to reveal the right ovary.

(*e*) The pregnancy mass was almost entirely free of adhesions, and the few adhesions that were present were very mild. In advanced tubal gestations there are usually many adhesions and the placental attachment is often an extensive one. Tumors that do not have a peritoneal covering nearly always become adherent to one or more structures in the abdomen. The only organs in the pelvic cavity that have no peritoneal covering and still remain free from adhesions are the ovaries. Since the tumor mass in the present case was smooth all the way round and almost entirely devoid of adhesions, this may be a point in favor of an intra-ovarian pregnancy.

(*f*) The right fallopian tube coursed over and in front of the fetal sac. In nearly all cases of large ovarian tumors, especially cystic ones, the fallopian tube assumes such a course. As the ovarian tumor grows the tube elongates, and this occurred in the present case.

(*g*) Microscopic study of numerous blocks of our specimen did not yield sufficiently clear-cut pictures to make a definite diagnosis, probably because the fetus had been dead for five and a half months and the tissue had degenerated. However, in one block there was a layer of cellular tissue that resembled ovarian cortex, and adjoining it was definite chorionic tissues.

SUMMARY

A case of abdominal pregnancy, probably ovarian in origin, is reported not because of the rarity of such gestations but to emphasize that a diagnosis of abdominal pregnancy can be made with certainty by injecting iodized oil into the uterine cavity. I believe this procedure should be employed in every case in which the diagnosis of abdominal pregnancy is strongly suspected, especially if clinical signs and x-ray plates show that the baby is dead. In the presence of a dead baby this procedure is practically harmless.

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Progress and the Experimental Method.—In all ages the implicit belief in orthodox theory or in authority has been the greatest bar to scientific progress. What chance was there of learning anything about the etiology of disease when every one believed for nearly a thousand years that disease was caused by some chance alteration in the admixture of four humors that no one had ever seen or demonstrated experimentally? Galen was a very great man, but medicine would not have gone backward for a thousand years had it not been for the slavish worship of his authority. Galen himself was an experimentalist. His followers swallowed his books whole and until the time of Vesalius considered it heretical to even question his anatomy in spite of the fact that Galen never dissected a human body. . . . Progress in scientific medicine has depended almost exclusively upon the experimental method. Hypotheses or theories are only useful when they lead to experiments to test their validity. They are an impediment when they are accepted without such experimental validation and become orthodox beliefs.—Vedder, E. B.: The Development of Tropical Medicine, *Am. J. Trop. Med.* **16**:1 (Jan.) 1936.

A FUNDAMENTAL, RECIPROCAL RELATIONSHIP BETWEEN MYELOID AND LYMPHOID TISSUES

ITS RECOGNITION, NATURE AND IMPORTANCE AS REVEALED BY EXPERIMENTAL AND CLINICAL STUDIES

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Progress in the solution of the problems of disease in many must depend to a considerable degree on fundamental progress in the recognition and interpretation of alterations in disturbed physiologic equilibriums. It may be true that physiology "has its own problems, great in number and enormous in complexity, and those of disease are not among them."[1] Nevertheless, experience has established that the origin and explanation of many abnormal states may be traced to deranged physiologic processes, and more particularly to disturbed physiologic equilibriums. Granted that this is beyond the scope of pure physiologic research, the recognition of states of physiologic imbalance and of pathologic alterations produced in the tissues by this imbalance then becomes an important concern of the clinical investigator. That this "borderline" territory between physiology and medicine has proved a very fruitful field for clinical investigation, in one direction at least, is quite apparent when one reviews the important progress that has been made in the diseases characterized by disturbances in the functional equilibriums of the endocrine glands. It is clear that this field of physiologic disequilibriums, occupying as it does a middle ground between medicine and physiology, is in real danger of neglect, although it is potentially very important in the search for and the explanation of the mechanism of disease.

It is our purpose in this paper to bring together and to organize a number of observations, both experimental and clinical, which have been accumulated in recent years in our laboratory from a widely divergent series of investigations and which, when taken together, constitute a body of fact pointing strongly toward the existence of a fundamental physiologic reciprocal relationship between myeloid and lymphoid tissues. The importance of this concept to certain clinical blood dyscrasias will be emphasized.

EXPERIMENTALLY INDUCED IMBALANCE OF THE CELLS IN THE CIRCULATING BLOOD

For a number of years we have been investigating the fundamental cellular reactions occurring in bone marrow and in the lymphatic tissues, not only in the course of natural disease but also, more particularly, as these tissues have been brought individually under the influence of substances that have a specific stimulatory effect on them. The demonstrated effectiveness of nucleic acid derivatives in promoting myelopoiesis,[3] and of native proteins in inducing lymphopoiesis,[4] each specific for the tissue designated, has been the subject of repeated communications from this laboratory and requires no further elaboration in this paper. Experience has proved that profound and sustained disturbances in the normal numerical balance between the granulocytes and the lymphocytes of the circulating blood regularly follow the daily intravenous administration of either of these substances in rabbits.

Disturbed Equilibrium Due Primarily to Myeloid Imbalance.—In our series of studies of myelopoiesis more than fifty rabbits have been injected intravenously with varying quantities of nucleic acid derivatives. Rabbit 0-81, one representative of this group, received sodium nucleinate daily over a period of four months. Starting with 50 mg. the quantity was periodically increased until during the final month of the experiment 1 Gm. of nucleinate in 10 cc. of sterile physiologic solution of sodium chloride was given intravenously each day (fig. 1). During the period of base line control counts, Dec. 10 to 23, 1930, it will be observed from figure 1 that the lymphocytes fluctuated between 4,000 and 5,800 per cubic millimeter of blood and that the neutrophilic granulocytes ranged between 900 and 2,000 per cubic millimeter of blood. Beginning with the sodium nucleinate injections, however, the granulocytes rose promptly and steadily during the first month, Dec. 23, 1930, to Jan. 21, 1931, but in addition there was a precipitous reciprocal fall in the lymphocytes. From January 21 to March 17 the neutrophilic leukocytes equilibrated on a plateau at an average of 6,000 cells per cubic millimeter of blood, during which time there were marked fluctuations in the total lymphocytes, the latter breaking through from the low point of 600 cells per cubic millimeter to temporarily higher levels, particularly on February 5 and 19. Although the granulocytes were pushed to still higher levels during the last month under the influence of daily 1 Gm. doses of sodium nucleinate, the lymphocytes stabilized at an average value of 3,000 cells per cubic millimeter, or at about 70 per cent of the preinjection level.

An autopsy was performed on this animal April 15, after termination of the experiment, by lethal injection of air.

The microscopic examination of these two tissue systems confirmed the gross appearances. The bone marrows were found without exception to be definitely hyperplastic, the hyperplasia being confined entirely to the neutrophilic or amphophilic myelocytes. The erythropoietic foci were both relatively and absolutely decreased in size and number. The myeloid hyperplasia was particularly apparent in the spleen and in the kidney,[3a] the latter organ being an exceedingly rare site for hematopoietic foci. In striking contrast to these tissues, the lymph nodes showed a degree of atrophy never before witnessed in the rabbit. Large acellular spaces filled with tissue fluid were abundant and replaced areas normally very cellular. Cells of the lymphoblastic series were infrequent, those cells remaining being old or degenerating lymphocytes. Some increase in fibroblasts was evident, although no actual scar tissue was found (fig. 2).

Artificially induced neutrophilic leukocytosis and myeloid (neutrophilic) hyperplasia under the conditions

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This paper is abbreviated by the omission of certain case data and illustrations. The complete article appears in the authors' reprints.

Read in part before the Twenty-Second Annual Meeting of the American Society for Experimental Pathology, Detroit, April 10-13, 1935, and in part before the Section on Pathology and Physiology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.

1. Cohn, A. E.: Medicine Science and Art, Chicago, University of Chicago Press, 1931.

3. (*a*) Doan, C. A.; Zerfas, L. G.; Warren, Sylvia, and Ames, Olivia J.: J. Exper. Med. **47**: 403 (March) 1928. (*b*) Doan, C. A.: Proc. Soc. Exper. Biol. & Med. **29**: 1030 (May) 1932; The Neutropenic State, J. A. M. A. **99**: 194 (July 16) 1932.

4. Wiseman, B. K.: J. Exper. Med. **53**: 499 (April) 1931.

of this experiment are accompanied consistently by a reciprocal lymphopenia and marked lymphoid hypoplasia.

Disturbed Equilibrium Due Primarily to Lymphoid Imbalance.—Experiments paralleling those just given, except that stimulus to the lymphoid structures was induced by the intravenous injection of foreign protein.

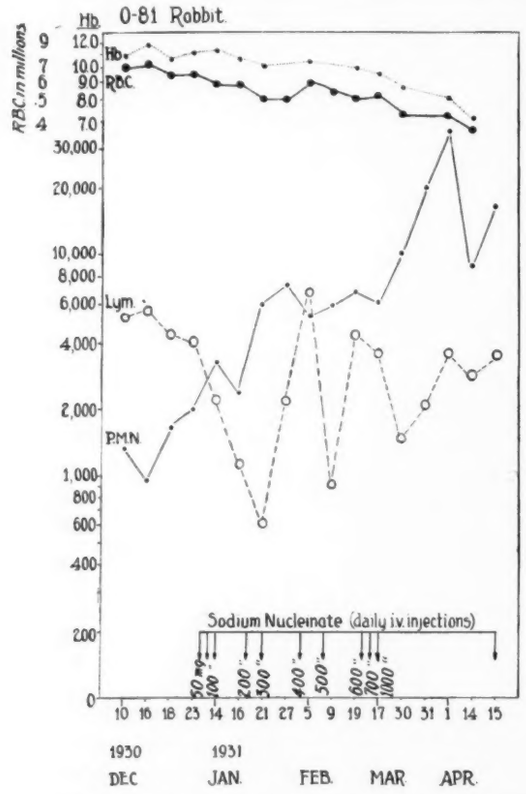

Fig. 1.—Blood changes in rabbit 0-81. This animal received intravenous injections of sodium nucleinate daily in increasing dosage as shown. Note the rise in granulocytes that occurred with the depression in lymphocytes and red blood cells.

were carried out in a series of rabbits totaling twenty-three. Foreign proteins from various sources were found capable of invoking the response herein detailed, but because of ease of preparation and adequacy of supply of fresh material, egg albumin was used as the principal stimulating agent. Typical of the reaction in this group may be cited the blood examinations from animal 0-318 (fig. 3). The period prior to March 21 consists of three and one-half months of base line control counts. Beginning March 21, 1934, and daily thereafter this animal received 50 mg. of egg albumin in 5 cc. of physiologic solution of sodium chloride given intravenously. A study of figure 3 shows that seven days after the first administration of this substance the peripheral level of lymphocytes began to rise and remained constantly elevated throughout the entire course of the experiment. A further study of this chart reveals the fact that the rise in the lymphocytes was accompanied by a sharp reciprocal fall in the neutrophilic granulocytes, the latter reaching a low point of only 480 cells per cubic millimeter of blood, April 7, coincident with the period during which the lymphocytes reached their high peak. Following this episode it will be observed that as the foreign protein became less effective in calling forth lymphocytes, probably because of the increasing precipitin titer of the serum against egg white, there was a corresponding partial recovery in the granulocytic levels (April 7 to 16) followed by a definite upturn in the numerical values for this cell type beginning April 20, the granulocytes and lymphocytes attaining a common proportionate representation in the blood ten days later.

Gross examination of the myeloid and lymphatic tissues of this animal as seen at autopsy revealed widespread changes, which were typical of all the animals in this series. Extreme hypoplasia of the bone marrow was evident in all the long bones, the regressive changes being evidenced by fatty replacement of a large part of the marrow cavities normally rich in myeloid cells. All deposits of lymphatic tissue were grossly enlarged, the popliteal node exceeding the average normal for this animal more than five times by weight. The spleen weighed 2.4 Gm., as contrasted with the average normal of 0.7 Gm. On cut section the nodes were very cellular, and supravital examination of the scrapings showed a considerable increase over the normal in lymphoblastic cells. The malpighian bodies were prominent and numerous, some of them measuring almost a millimeter in diameter.

Microscopic examination of the bone marrow confirmed the gross appearance. Figure 4 represents a low power view through a typical atrophic area. It will be observed that in these fields there is almost total aplasia. Other areas from the long bones, not visibly altered in the gross, nevertheless showed definitely less blood cell formation than normal. The diminution or absence of megacaryocytes was particularly striking. Microscopic study of the marrow from ribs and sternum failed to show definite changes of any kind. This was not wholly unexpected, as it is the usual experience to find the marrow in these locations the last to be affected and the first to respond in hypoplastic states, and recovery was already occurring in this animal at the time of the autopsy.

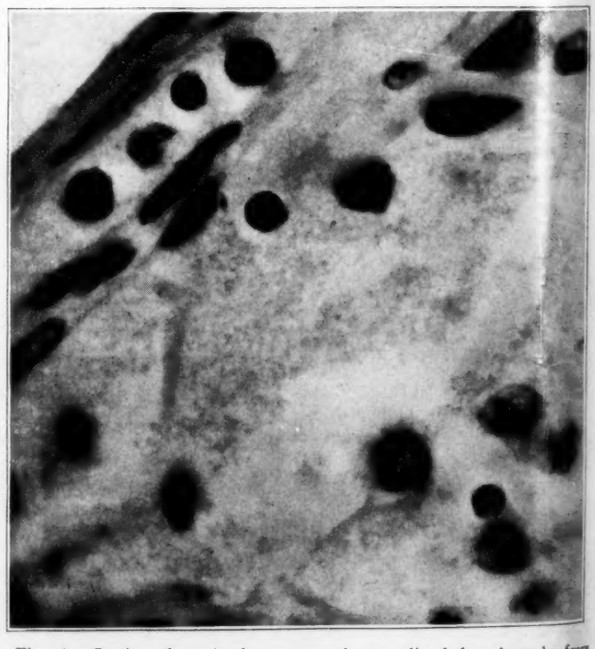

Fig. 2.—Section through the cortex of a popliteal lymph node from rabbit 0-81. This animal had received intravenous injections daily for approximately two months of sodium nucleinate in increasing dosage of from 0.05 to 1 Gm. Note the absence of cells in this area, which normally is very cellular. The absence of young lymphocytes is also a feature. Oil immersion view.

Microscopic changes of the lymphatic tissues in contrast to the bone marrow showed undoubted hyperplasia. In many of these nodes proliferating lymphoid tissue almost completely filled the medulla of the node.

thus converting this structure into a mass of diffuse lymphatic tissue with obliteration of the normal corticomedullary architecture. The spleen was especially rich in lymphocytes, neighboring follicles often becoming confluent (plates 1 and 2 in former publication [5]).

The data assembled from this group of animals indicate that experimental stimulation of lymphatic ele-

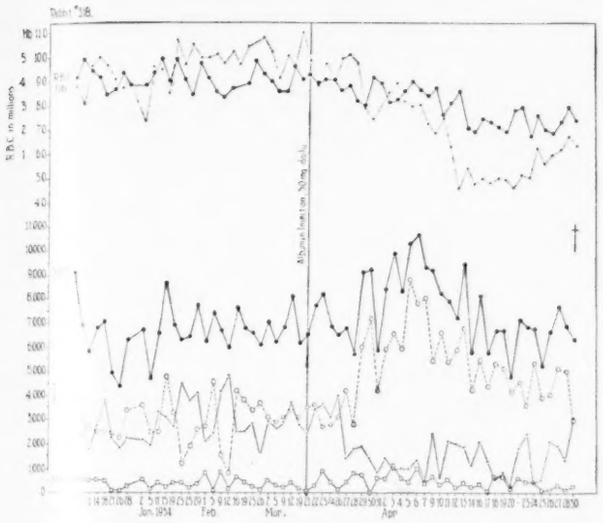

Fig. —Blood changes in rabbit 0-318. This animal received intravenous injections of 50 mg. of egg albumin daily for forty-one days. Note the depression in granulocytes which occurred simultaneously with the elevation of lymphocytes. The developing anemia is clearly shown. The animal gained weight constantly throughout this experiment.

ments with foreign protein results in a reciprocal reduction in the myeloid elements. It is again apparent that the overgrowth of one type of blood-forming tissue influences adversely the growth of the other. The fact that the monocytes are unaffected during these changes in the myeloid and lymphoid elements attests further to the limited two-way specificity of this reciprocal reaction. It is well known that the monocyte depends neither on the bone marrow nor on the lymphatic tissues for its origin arising in the diffuse connective tissues distributed everywhere in the body.

It would appear, therefore, that there is a constant physiologic balance or reciprocal relationship existing between the myeloid and lymphatic tissues, which controls and in turn is reflected by a constantly changing ratio of granulocytes to lymphocytes in the peripheral blood in response to normal and pathologic stimuli. The importance of this fundamental law of reciprocal hematopoiesis is at once apparent in the interpretation of the blood pictures produced by disease.

CLINICAL STUDIES OF MYELOID AND LYMPHATIC IMBALANCE

Many factors each having a specific and often divergent influence on the blood cells are always present in clinical disease. Fever alone exerts a powerful influence on the blood-forming tissues and has only recently been scientifically appraised.[6] Many other influences not yet studied undoubtedly serve to alter the blood response in disease, so that the demonstration of relatively "pure" clear-cut reactions, such as may be obtained in the experimental laboratory, is as a rule not possible in the clinical patient. That is to say, the reactors in disease are multiple and often result in cellular responses that tend to becloud an interpretative dissection of the blood picture. Nevertheless, striking examples of the effects which may become manifest in human disease when this physiologic balance between myeloid and lymphoid tissues is impaired have been observed. As may be anticipated, these tissue and blood responses are most clearly defined when the stimulus is somewhat specific for, and limited to, one or the other of the blood-forming tissues.

Infectious Mononucleosis.—Infectious mononucleosis affords an excellent example of a disease in which lymphoid hyperplasia is commonly almost the sole pathologic feature present. A study of the blood cells in some thirty-two cases which we have observed shows quite regularly that the high values for the lymphocytes are accompanied by low relative and absolute values for the granulocytes. Figure 5 shows this phenomenon graphically. This patient was first seen about eighteen hours after the clinical onset of symptoms. There was the usual malaise, Vincent's infection of the tonsils, generalized adenopathy and a barely palpable spleen. Following our first observation, Sept. 8, 1933, the lymphocytes, already distinctly elevated and showing the characteristic qualitative changes, rose steadily to a maximum of 8,800 cells per cubic millimeter of blood by the 11th. Accompanying this rise in lymphocytes there was a steady decrease in the circulating granulocytes, these cells reaching the very low value of 500 neutrophils per cubic millimeter of blood September 15. Concurrent with the subsequent fall in lymphocytes it will be observed from this chart that the granulocytes rose sharply, reaching the normal value of 4,000 cells at the same time, October 11, that the lymphocytes returned to within their normal level of 3,000 cells per cubic millimeter of blood. Following this there was a further slight rise in the lymphocytes, which was accompanied by a slight drop in the granular cells (October 11 to December 13), and finally a sharp drop

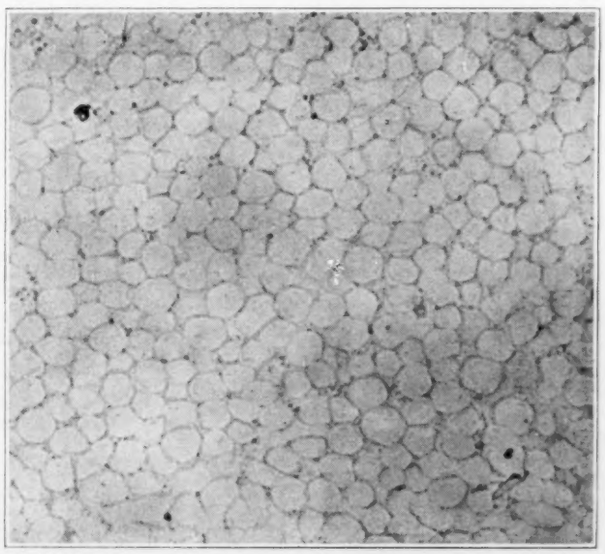

Fig. 4.—Section through the bone marrow of the femur from rabbit 0-318. This animal had received intravenous injections of egg albumin, 50 mg. daily, for forty-one days. Absence of myeloid activity and fatty character of this marrow is clearly shown. Low power view.

in the lymphocytes coinciding with an equally sharp rise in the granulocytes. It will be observed that during this entire period there was a slight fall in the red blood cells, most marked when the lymphocytes were highest and leveling off when these cells were near the limits of normal. At the last observation, the lymph nodes in this individual were still quite definitely enlarged, and

5. Wiseman, B. K.: J. Exper. Med. **54**: 271 (Aug.) 1931.
6. Hargraves, M. M., and Doan, C. A.: Proc. Fifth Annual Fever Conference, Dayton, Ohio, 1935, p. 51.

it will be observed that neither the red cells nor the granular cells had returned quite to normal. This would seem to be best explained, in view of the experimental work cited, by attributing the obvious depression of the bone marrow to the inhibitory effects of the lymphatic tissue.

Hypoplastic Anemia.—This is usually regarded not as a clinical entity but as a state of hemocytologic deficiency directly traceable to the effects of a variety of etiologic agents. Certain toxic substances, notably benzene,[9] x-rays and radium,[10] arsphenamine,[11] trinitrotoluene[12] and bacterial toxins[13] depress marrow function. In multiple myeloma and in widespread tumor metastases to the marrow,[14] active hematopoietic tissue is destroyed by mechanical displacement. After due recognition is given to all the known causes which tend to depress the formation of the elements that take their origin in the bone marrow, however, there remains a residual so-called idiopathic group in which the etiologic factor or factors is not so obvious. Some of these cases appear to be identified with states of

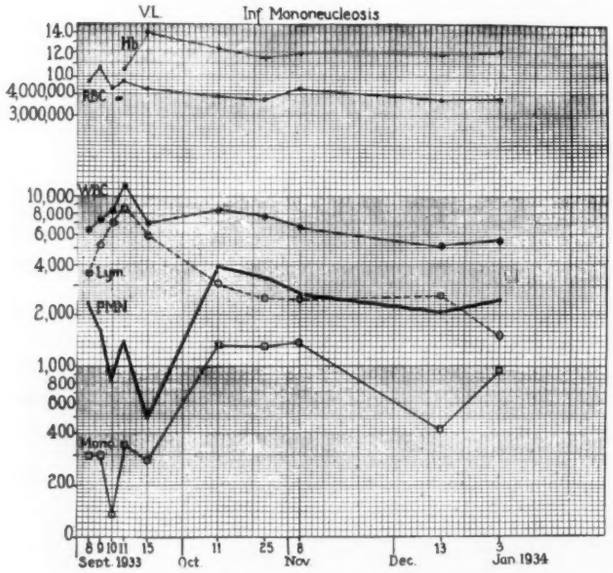

Fig. 5.—Blood changes in patient V. L., showing the reciprocal relationship between lymphoid and myeloid cells.

unexplained lymphoid hyperplasia that are not clearly either lymphosarcoma or leukemia. The following case suggests that altered relative volumes of lymphatic and myeloid tissue may be important in determining or initiating progressive hypoplasia of the bone marrow in some cases in this "idiopathic" group:

CASE 1.—A white girl, aged 3 years, admitted to the University Hospital, Aug. 22, 1934, complained chiefly of pallor and weakness, which were said to have been present for two weeks prior to admission. The past history revealed no significant facts. On examination, the patient appeared to be acutely ill; she was very pale; the respirations were rapid, but there was no evidence of loss of weight; the tonsils were large; the pharynx was injected; the cervical glands were large, discrete, not attached to the skin and not tender. The epitrochlear, axillary and inguinal glands also were enlarged, ranging in size up to that of a lima bean. When the abdomen was examined the liver was found to be enlarged to 7.5 cm. below the costal margin in the right anterior axillary line. The spleen extended down 2 cm. below the left costal margin. Blood count performed on admission showed 3,200 white blood cells, 1,065,000 red blood cells, platelets 11,000 per cubic millimeter and hemoglobin 3.9 Gm. per hundred cubic centimeters of blood; reticulocytes 0.1 per cent and a differential of 16 per cent polymorphonuclears, 2 per cent metamyelocytes, 2 per cent myelocytes C, 78 per cent lymphocytes and 2 per cent monocytes. There was a shift to the left in the lymphocytes, but no leukemic cells were found. The clinical diagnosis was aplastic anemia with terminal secondary infection. Autopsy was performed by Dr. H. L. Rhinehart, pathologist to the University Hospital. There was moderate hypertrophy of the lymphoid tissue, especially the retroperitoneal, mesenteric and perigastric nodes, with prominent Peyer's patches and solitary follicles. Peripheral nodes were increased in size and seemed to be slightly fibrous on cut section. Bone marrow removed from the right femur, tibia, sternum and ribs showed the marrow cavity of normal size, filled with soft marrow, apparently fatty on the periphery and hemorrhagic in the center. Supravital scrapings from these areas showed very few cells.

Microscopically the lymph nodes (fig. 7) showed many young lymphocytes and diffuse hyperplasia, with invasion of the medulla by hyperplastic lymphoid tissue. There was definite increase in lymphoid tissue about the gastro-intestinal tract. The liver showed marked atrophy and degeneration about the central veins and lobules, cloudy swelling throughout, and miliary abscesses. The spleen showed marked increase in pulp, with considerable congestion and very active malpighian bodies. The bone marrow sections (fig. 8) throughout showed marked atrophy, with considerable fibrous tissue proliferation. The remainder of the microscopic examination did not reveal anything additional to that observed in the gross. There was no evidence of leukemic infiltration in any of the tissues.

Both the clinical and the microscopic changes seemed to be quite classic for aplastic anemia, with terminal secondary infection, except that there was moderate to marked lymphoid hyperplasia. It is difficult to harmonize the adenopathy with the bone marrow hypoplasia on the ground of terminal infection alone, as it is well known that infectious states tend to cause atrophy rather than hypertrophy of the lymphoid tissue. It is significant that the lymphoid tissues were found to be unusually active in contrast to a relatively inactive bone marrow. It would seem, in view of the reciprocal reactions cited, that one must consider the possibility of a specific depressive effect on the bone marrow, through an overbalance of the lymphatic components.

The observation of a second case similar to that described establishes the fact that, at least in some cases of "aplastic" anemia, the reduced volume of active myelopoietic tissue occurs in association with a reciprocal increase in the volume of lymphoid tissue.

Recent work has emphasized the effects produced on the bone marrow by surgical removal of the spleen.[15] In many instances, extirpation of this organ is followed by increased hematopoiesis with elevated levels of cells in the peripheral blood. After due consideration is given to local factors of sequestration and destruction of blood cells there still remains an apparent effect of the spleen on the bone marrow which tends to regulate

9. Selling, L.: Bull. Johns Hopkins Hosp. **21:** 33, 1910. Hamilton, Alice: The Growing Menace of Benzene (Benzol) Poisoning in American Industry, J. A. M. A. **78:** 627 (March 4) 1922. McCord, C. P.: The Present Status of Benzene (Benzol) Poisoning, ibid. **93:** 280 (July 27) 1929.

10. Martland, H. S.: Occupational Poisoning in Manufacturing of Luminous Watch Dials, J. A. M. A. **92:** 466 (Feb. 9), 552 (Feb. 16) 1929. Faber, K.: Ugesk. f. læger **85:** 8 (Jan. 4) 1923.

11. Moore, J. E., and Keidel, Albert: Stomatitis and Aplastic Anemia Due to Neoarsphenamine, Arch. Dermat. & Syph. **4:** 169 (Aug.) 1921.

12. Voegtlein, Carl; Hooper, C. W., and Johnson, J. M.: Bull. 126, U. S. P. H. S. Turnbull, L.: Proc. Roy. Soc. Med. **10:** 1, 1916.

13. Smith, L. W.: Report On An Unusual Case of Aplastic Anemia, Am. J. Dis. Child. **17:** 174 (March) 1919. Minot, G. R.: Diminished Blood Platelets and Marrow Insufficiency, Arch. Int. Med. **19:** 1062 (June) 1917.

14. Marsh, H. E.: Ann. Clin. Med. **3:** 162 (Aug.) 1924. Herz, O.: München med. Wchnschr. **73:** 868 (May 21) 1926. Lee, R. I., and Minot, G. R.: Nelson Loose Leaf Medicine, New York **4:** 28, 1928.

15. Doan, Zerfas, Warren and Ames.[3] Doan, C. A.; Curtis, G. M., and Wiseman, B. K.: The Hemolytopoietic Equilibrium and Emergency Splenectomy, J. A. M. A. **105:** 1567 (Nov. 16) 1935. Krumbhaar, E. B.: Am. J. M. Sc. **166:** 329 (Sept.) 1923. Barcroft, Joseph: Lancet **1:** 319 (Feb. 14) 1925. Barcroft, Joseph, and Nisimaru, Y.: J. Physiol. **74:** 299 (March) 1932.

downward the production of these cells. In explanation of this relationship it has been suggested that there may be a direct inhibitory effect of the spleen on the bone marrow similar in nature to that of a hormone influence. Since the spleen represents the largest single accumulation of lymphatic tissue in the body, the experimental data in this communication give weight to the interpretation of the postsplenectomy-cellular increases from the marrow, on the basis of the elimination of a substantial volume of lymphatic tissue. This establishes a rationale and provides the explanation for the favorable effects observed by therapeutic removal of the spleen in selected cases of "aplastic" anemia.

The important point to be determined is whether the hypoplasia of the bone marrow is primary or secondary to an overgrowth of the lymphatic structures. It is believed that the evidence for reciprocal hypoplasia and hyperplasia as furnished by the cases of leukemia which follow provides, in addition to the experimental evidence, substantial reasons for favoring the latter explanation over the former.

THE LEUKEMIAS

A. *Lymphatic.*—It has been held generally that the widely observed depression in bone marrow function which usually accompanies lymphatic leukemia is a result of the mechanical crowding out of the myeloid and erythroid elements by the infiltration of lymphatic elements. The relative importance of this mechanism in determining "symptomatic" hypoplasia of the marrow tissue, however, has not been established. In no other tissue of the body does lymphoid infiltration produce such widespread, almost total, failure of function and destruction of a parenchymatous organ. On the other hand, if the chief force that determines hypoplasia of the marrow elements in lymphatic leukemia is the increased volume of lymphocytes elsewhere acting through a specific reciprocal inhibitory influence rather than by mechanical pressure, hypoplasia of the bone marrow should be found in cases in which there is minimal evidence of the infiltration phenomenon. The following case of "aleukemic" lymphatic leukemia provides evidence that increased volume of lymphatic tissue and not marrow infiltration may be an important or even the chief determining factor in the hypoplasia of the bone marrow in lymphatic leukemia:

CASE 2.—A child, aged 2 years, admitted to the University Hospital, Feb. 10, 1935, complained of weakness, pallor and purpuric phenomena.

During the stay in the hospital of forty-nine days, the anemia and tendency to hemorrhage was combated with four blood transfusions, but the case ran the usual course of a leukemia with several relapses followed by partial remissions. The patient died showing widespread hemorrhages from the mucous membranes and into the skin. The blood examination at the time of death showed 12,000 white blood cells, with a differential of polymorphonuclear leukocytes 10 per cent, myelocytes C 4 per cent, lymphocytes 82 per cent and monocytes 4 per cent. The red blood cells were 2,200,000, platelets 29,000 and hemoglobin 5.8 Gm. per hundred cubic centimeters of blood. The autopsy was performed by Dr. Reid Joyce, and in abstract revealed the following: There were purpuric spots on the scalp and over the cheeks, abdomen, chest, back and lower extremities. The occipital, cervical, axillary and inguinal nodes were definitely enlarged and varied in size from a pea to that of a lima bean. The lymph nodes of the mesentery, the lumbar chain and the tracheobronchial trunks were particularly prominent, individual nodes reaching the size of a walnut. The liver weighed 650 Gm. and extended 5 cm. below the costal border in the right mammary line and 6.5 cm. below the xiphoid process of the sternum. The spleen weighed 200 Gm. and extended below the costal border 2.5 cm. With the exception of hemorrhage into the parenchyma, the kidneys were not abnormal grossly. There were numerous hemorrhagic areas on the surface of the peritoneum, pleura, epicardium and endocardium. No pneumonia or tuberculosis was evident in the lungs. Bone marrow was secured from the tibia, femur, ribs and sternum and appeared in the gross to be marked by widespread hemorrhage and an increase in fibrous tissue.

The microscopic sections, with the exception of the bone marrow, revealed the usual lymphoid changes that are characteristic of lymphatic leukemia. The bone marrow was definitely hypoplastic without significant lymphoid infiltration in the areas studied. Only an occasional area showed the presence of many infiltrating leukemic cells. Figure 9 shows a section through the sternum, usually hyperplastic, in illustration of the presence of hypoplasia of marrow elements without concomitant lymphoid infiltration.

B. *Myelogenous Leukemia.*—Generalized swelling of the lymphoid structures in cases of myeloid leukemia is an almost constant feature of this disease. The reaction occurring within these structures which gives rise to such enlargement is, however, not clear beyond the fact that the cellular content is predominantly myelocytic. Protagonists of the unitarian theory of blood formation hold that the myeloid cells arise in situ by virtue of the metamorphosis of the (totipotential) lymphoid elements. In contrast to this is the belief of many adherents of the polyphyletic doctrine that the explanation for the enlargement of the lymphatic nodes lies in the fact that these structures are infiltrated with primitive myeloid cells, in common with the other tissues throughout the body, and that these cells proliferate in exactly the same fashion as occurs in the bone marrow, the intrinsic lymphoid elements remaining passive and not undergoing myeloid metaplasia.

The following case of myeloid leukemia provided an opportunity not only to observe the histologic effects on lymphoid tissue when myeloid stimulation was dominant but also to clarify considerably the controversial points discussed in the foregoing paragraph:

CASE 3.—A white boy, aged 11 years, was admitted to the pediatric service in the University Hospital, Jan. 29, 1934, and a diagnosis of acute myeloblastic leukemia was made.

Autopsy was performed August 6 by Drs. Lacey and Hargraves. The gross examination, in abstract, revealed an extensive sloughing lesion of the left side of the face with loss of the entire cheek and the left half of the mandible. There was an almost complete absence of subcutaneous fat. The peripheral lymph nodes were not palpable. The liver extended 5 cm. below the costal border and weighed 970 Gm. The spleen extended to the costal border, weighed 250 Gm. and showed multiple white areas about 1 mm. in diameter. The lymph nodes, both superficial and deep, were very small, measuring from 2 to 5 cm. in diameter, and were difficult to find. There were about 200 cc. of clear straw colored pericardial fluid and about 500 cc. of blood-tinged fluid in the peritoneal cavity. The bone marrow of the entire skeleton was characterized by extreme hyperplasia of gray tissue.

Microscopic study showed extreme myeloid hyperplasia of all bone marrow tissues, with a predominance of early myeloid cells. The spleen was heavily infiltrated with myeloid cells, and the lymphocytes of the malpighian bodies were largely replaced with myelocytes and myeloblasts. The lymph nodes presented a remarkable picture. On section they cut with greatly increased resistance, scrapings for supravital examination were obtained with great difficulty, and only a few cells could be found. All nodes showed a marked degree of atrophy, and the lymphocytes obtained from them were nearly all old types. Only an occasional myelocyte was found, but fibroblastic proliferation was prominent. Figure 10 shows the degree of atrophy and the absence of myeloid infiltration that characterized all the nodes.

This case afforded an opportunity to observe the state of the lymphoid structures when infiltration with myeloid elements was not present. Under such circum-

stances, the degree of atrophy of the lymphoid structures was remarkable. Fibrous tissue replacement of the normally rich lymphocytic areas in the nodes was comparable to that observed in the nodes of the animals with nucleinate induced leukocytoses. It was also noteworthy that although the bone marrow was hyperplastic for myeloid cells very few of these cells were found in the lymph nodes. The latter fact suggests that myelopoiesis, when it occurs in the lymph nodes, arises from metastatic cells and not from stimulation of the primitive cells preexisting in the nodes, since it is clear that in this case the stimulus for myeloid proliferation, although still dominant and effective in the body as reflected in the bone marrow, failed to stimulate the primitive cells in the lymphoid tissue to myeloid proliferation. In fact, quite the opposite condition prevailed, since atrophy and diminution in all cellular elements was the net result. It is felt that the tissue reactions in this case provide strong evidence for the theory of a reciprocal relationship existing between lymphoid and myeloid tissues in that the specific stimulus for myelopoiesis was accompanied by inhibition of lymphopoiesis in lymph nodes which did not show infiltration of myeloid cells.

COMMENT

The evidence cited, both experimental and clinical, strongly suggests the existence of a definite physiologic equilibrium between myeloid and lymphatic tissues. There would also seem to be some ground for the belief that physiologic and pathologic disturbances of this balance may lead to definite blood anomalies. While the evidence is only suggestive and not conclusive that lymphoid imbalance may play an etiologic rôle in the production of a specific type (not all types) of "aplastic" anemia, we nevertheless feel that the interpretation of the facts observed justify further consideration, study and experiment.

There would seem to be only two possible explanations for the reciprocal phenomena observed, as shown in the accompanying tabulation. First may be suggested the existence of a single substance (molecule) having stimulatory properties in one location and inhibitory effects in another location for the common stem cell. This hypothesis would seem to be decidedly contrary to both experience and logic. Modern beliefs relating to blood formation indicate that, at least with respect to the white blood cells, all stem cells, wherever found, are identical in potency.[16] That they differentiate along dissimilar lines is the result of different environmental influences, different stimuli, or both. This explanation of the physiology of blood formation makes it extremely difficult to conceive of a single substance that could affect the same cell so differently with only the added help of a conditioning environment.

The only other obvious explanation that could adequately explain the facts of reciprocal response is integrated with the concept of a physiologic cellular equilibrium. This hypothesis entails the corollary that any considerable increase in the volume of either tissue must result in a corresponding diminution in the volume of the other. The experimental and clinical observations available apparently confirm this theoretical explanation and no facts at present contradict it. Positive proof must await further direct experiment. The mechanism whereby this equilibrium is physiologically controlled can be only a matter for speculation at this time. Possibly there is only a limited and fixed amount of maturative substance essential for maturation present in the body at any one time, and a diversion of this material to one or the other of the actively growing tissues results in a deficit in supply to the other, the latter therefore undergoing involution. Possibly there is a specific inhibitory influence of each tissue on the other. Whatever the method whereby the equilibrium is controlled, it seems quite certain that some of the factors that influence or effect the balance of these tissues are clear. Endogenous or exogenous stimuli, toxins and similar substances specific for each cell type are undoubtedly important in disturbing the physiologic equilibrium. It is also certain that mechanical and physical factors may definitely alter the normal balance of these cells. This discussion therefore makes it probable that, fundamentally, two distinct types of clinical disease are theoretically possible as a result of a disturbance in this normal relationship: one in which the disturbing factor is secondary to an abnormal state elsewhere (example, infectious mononucleosis), and, second, a type in which the disturbance is intrinsic and due to a failure of physiologic control (cited cases of "aplastic" anemia). Irrespective of the merits of the speculations herein, it is certain that the phenomena of reciprocal relationships of the blood cells must be considered henceforth in the interpretation (1) of the mechanism of cellular reactions, (2) of the microscopic changes in the blood forming tissues and (3) of the peripheral blood elements, not only in disease states in general but more especially in the blood dyscrasias.

SUMMARY

1. Experimental induction separately of myeloid and lymphoid tissue hyperplasia in rabbits suggests that hyperplasia of each tissue occurs at the expense of hypoplasia in the other. These changes are usually reflected in the peripheral blood by a reciprocal alteration in the levels of the myeloid and lymphatic cells.

2. Observations on the blood and tissues in certain clinical diseases provide instances in which this reaction is apparently responsible for some of the hitherto puzzling blood and tissue alterations regularly found.

3. It is suggested that disturbances of physiologic origin which alter the normal balance of blood-forming tissues may be important in the etiology of some of the blood dyscrasias. Two cases of "aplastic" anemia with unusual features, which have been cited, possibly belong to this class.

1995 Tewksbury Road.

16. Wiseman, B. K.: The Origin of the White Blood Cells, J. A. M. A. **103**: 1524 (Nov. 17) 1934.

ABSTRACT OF DISCUSSION

DR. E. B. KRUMBHAAR, Philadelphia: I am more impressed by the experimental evidence than by the clinical. Physicians are obviously handicapped in their approach to the study of an individual clinical case as compared with a similar study of experimental material and by the limitations of our ordinary blood counting technic. For instance, if one wants to get the absolute numbers of lymphocytes in a normal case and in a case of leukemia, one takes the total count of a normal case, say 8,000 leukocytes, and, if there are 25 per cent lymphocytes, that will give 2,000 lymphocytes. That figure is reached by taking a very small sample of blood as the basis for the total count and an equal amount of blood for the differential count; they are different samples in which a very small number of the actual cells are counted, the results being applied to large figures. There are numerous possible sources of error in such a technic. On the other hand, in a myeloid leukemia count, say 800,000, cells, of which only 1 per cent are lymphocytes by the differential smear, that would give 8,000 lymphocytes. It would have to be admitted that one could easily get 1.5 per

cent instead of 1 per cent, which would give 12,000 lymphocytes instead of 8,000. It is easy to see that the possible error in such a method is very large. I don't mean in any way to imply that the authors' counts are due to such errors, but such difficulties should be taken into account when one is studying clinical material and making deductions from these methods. Both the lymphocytes and the granulocytic series are concerned with resistance of the body to noxa of various kinds—to be sure, with different phases of the problem, but still enough on the same side that one would expect, a priori, a synergistic relation of these two types of blood cells rather than a reciprocal inhibitory effect. Also one must take into account the occurrence of multiple stimuli which may override reciprocal relationship. That offers a perfectly logical explanation of such clinical cases when one fails to find this relationship but instead finds an increase of both polymorphonuclears and lymphocytes and other elements. However, if one has to take such exceptions into account and explain them in that way, it seems to me that that robs the clinical evidence of some of its significance. None of this, however, applies to the experimental evidence, which to me was very convincing, as were the histologic pictures of the marked inhibitory changes in the appropriate tissue. The remarks that I have brought forward should be taken in the light of suggestions for future study of the problem.

DR. B. K. WISEMAN, Columbus, Ohio: This type of work, just as in all hematologic work, is in a state of flux at this time, and it will take many years to reveal the true significance of the investigative approaches being made from many angles.

Clinical Notes, Suggestions and New Instruments

PERFORATION OF THE GALLBLADDER, WITH MASSIVE INTRAPERITONEAL HEMORRHAGE

WILLARD BARTLETT JR., M.D., AND ROBERT W. BARTLETT, M.D., ST. LOUIS

Perforation of the gallbladder is itself an uncommon lesion but, when accompanied by massive hemorrhage, is an event of extreme rarity. A review of standard surgical textbooks, such as those of Babcock, Da Costa, Homans and Ashhurst, and of the Nelson and Lewis systems, discloses no mention of gross hemorrhage as a complication of perforation of the gallbladder. Moreover, one finds no reference to it in the large series of cases of perforated gallbladder reported by various authors. In reviewing the literature since 1900 we found mention of only two cases similar to the one reported herewith.

Waters[1] reports the case of a 63 year old woman who was seen after four days of illness with an abdominal emergency. Abdominal exploration was made, with a tentative diagnosis of intestinal obstruction. Free blood and clots were encountered everywhere in the abdomen. "When the gallbladder was palpated the exploring hand withdrew about ten faceted stones of varying size. The true condition was then recognized." Further investigation revealed a perforation at the gallbladder neck, which had torn the cystic artery; there had been no local effort at walling off the perforation. About 200 stones were removed from the gallbladder after its fundus had been opened. Then, since the patient was in a precarious condition, a hemostat was placed at the neck of the gallbladder below the site of rupture and another along its hepatic attachment. A gauze pressure pack was then placed under the neck of the gallbladder. The patient recovered after a stormy postoperative course and was discharged about a month after admission to the hospital.

Schnyder[2] records the case a 72 year old man who entered the hospital in a moribund condition two days following the onset of abdominal pain and vomiting. Death occurred within a few hours, and autopsy disclosed about two liters of free blood and clots in the abdominal cavity. The gallbladder was thickened and had suffered a tear 4.5 cm. in length through the site of an ulcer 4.5 by 2 cm. situated in the wall of the free portion of the gallbladder. In the fundus was a much smaller, very deep ulcer showing grossly an eroded open blood vessel. The gallbladder contained no stones. It was the implied contention of the author that the erosion of the vessel resulted in bleeding into the gallbladder, and the subsequent rupture of the weakened wall at the site of the larger ulcer. No microscopic characteristics of either ulcer were described.

1. Waters, E. C.: M. J. & Rec. **123**: 11 (Jan.) 1926.
2. Schnyder, K.: Zentralbl. f. allg. Path. u. path. Anat. **26**: 361, 1915.

REPORT OF CASE

History.—The case we report is that of Mrs. C. P., aged 65, white, a housewife, who was admitted to the Evangelical Deaconess Hospital, Feb. 11, 1935, at noon, with chief complaints of abdominal pain, distention of the abdomen and constipation.

During the past year, two attacks of pain occurred in the epigastrium and between the scapulae, waking her at about 3 a. m., with vomiting once in each attack followed by immediate relief of pain and return to sleep. February 9 a similar attack recurred but pain persisted, continuing thereafter, being generalized with a slight tendency to localize in the lower quadrant. Abdominal distention came on within two hours and had been unrelieved by countless enemas since. Vomiting occurred three times February 9, twice on the 10th and twice early on the 11th, but never a larger amount than ingested. There were two soft normal stools shortly after the onset of pain; no passage of stool or flatus had occurred since. There was slight frequency of urination with the present attack; no burning, pain or hematuria was observed.

The family history was irrelevant. The patient had never had any serious illness or operation. She had had dyspnea on exertion for years. There were no food idiosyncrasies; stool occurred daily without physic. An uneventful menopause occurred at 52. There were several children living and well. The husband was in good health.

Physical Examination.—We first examined the patient in her home in consultation with her physician, Dr. Edward H. Eyerman, at 3 p. m., February 10. The patient was obese, obviously dehydrated and in considerable pain. The temperature was 100, the pulse 85. The abdomen was distended and the diaphragm elevated; there was generalized slight abdominal tenderness, possibly more pronounced in the epigastrium. There was no peristalsis to auscultation; no masses or viscera were palpable. Leukocytes numbered 15,000. A tentative diagnosis of low intestinal obstruction associated with some such intraperitoneal infection as a perforated diverticulum was made, and immediate removal to the hospital was urged. Our combined efforts toward this end were unavailing.

On examination after admission to the hospital the following day at noon, more dehydration was evident in the dry tongue, sunken eyes and skin. Examination of the head and neck gave negative results. The heart and lungs were normal except for a snapping second aortic sound. The abdomen was distended and presented generalized tenderness, no rigidity, but dulness in the flanks. The patient voluntarily indicated the right lower quadrant and the right flank as the source of her trouble. Pelvic and rectal examinations were negative, the temperature 104.4, pulse rate 102, respiration 40, blood pressure 165 systolic and 70 diastolic, hemoglobin 62 per cent, erythrocytes 3,396,000, leukocytes 20,000. The Schilling count showed segmented forms 78 per cent, stabs 10 per cent, lymphocytes 11 per cent and monocytes 1 per cent. Voided urine obtained somewhat later was acid, of amber color, specific gravity 1.025, albumin negative, sugar positive (intravenous administration), bile negative, indican positive and acetone positive. Microscopically there were 10 pus cells, a few red blood cells and a few hyaline casts per high power field.

A roentgenogram of the abdomen showed enormous distention of the large intestine and cecum, but no small intestinal patterns and no fluid levels. This finding again raised the question of a low obstruction with a competent ileocecal valve, and a small barium sulfate enema was administered by Dr. Joseph Peden; the barium passed promptly well across the transverse colon. Its administration was stopped for fear of increasing the pressure within the distended cecum. Fluoroscopic examination of the chest showed what appeared to be a

nodule in the right lung base just above the diaphragm; a film showed an irregular area of infiltration of uncertain nature.

On the return of the patient from the roentgen examination a nasal catheter was passed into the stomach and only 100 cc. of light green fluid was obtained; continuous suction[3] was started. One thousand cubic centimeters of Hartmann's solution was given as a hypodermoclysis and 1,500 cc. of 5 per cent dextrose in physiologic solution of sodium chloride intravenously at the rate of 500 cc. an hour. At 4 p. m. the patient looked much fresher and brighter; the pulse rate was 90, respiration 35, blood pressure 195/95, temperature 99.6. Only 75 cc. of greenish fluid had been recovered by suction from the stomach by this time. The patient was then considered to be a reasonable risk for operation. Our preoperative note at 4 p. m. states that there was practically no fluid in the stomach after two hours' suction. With the roentgen observations, fever and blood picture, it seemed certain that distention was due to an infectious process with paralytic ileus. Entire lack of localizing signs on physical examination left us faced with exploration without a more definite diagnosis, but the very absence of such observations favored retrocecal appendicitis, probably perforated; less likely diagnoses were ovarian tumor on a twisted pedicle, Meckel's diverticulum, strangulated internal hernia, and so on. A chest film showed an area of increased density that might be an early pneumonia, but it was not of sufficient significance to postpone operation.

Operation.—After morphine and ephedrine hypodermically, spinal analgesia was induced with 175 mg. of procaine hydrochloride. An incision was made at the middle third of the right rectus muscle, the latter being shelled out of its sheath, and fluid blood under tension welled out of the peritoneal cavity as soon as it was opened. Exploration of the pelvis revealed only an atrophic uterus with normal adnexa. It was estimated that there were 2 liters of fluid blood in the abdominal cavity and many clots. The exploring hand encountered several gallstones in the pelvis, following which the incision was extended upward to the rib margin, and the gallbladder was visualized. There was no sign of any localizing process around the gallbladder, on the under surface of which was a fairly clean, straight rent, 3 cm. long, from which dark, apparently venous, blood was slowly welling; there was no distinct arterial spurting. The gallbladder wall was thin and the organ was of approximately normal size. Probably more than 100 small, faceted stones were scattered around the peritoneum and a few remained in the gallbladder; there was partial separation of the gallbladder from the liver bed, and the latter was not bleeding. The rent in the gallbladder was sutured with a continuous suture in two rows, and a large Pezzar catheter was introduced through a small incision in the fundus into the gallbladder and the wall was inverted snugly around it with two rows of sutures. A gauze pack was placed around the gallbladder, brought out at the upper angle of the incision, and walled off from the hollow viscera with a layer of gutta percha. The abdominal wall was then closed as a single layer with through and through sutures of silkworm gut.

Postoperative Course.—A transfusion of 500 cc. of blood was given immediately, and routine peritonitis care was instituted, including inhalations of carbon dioxide and oxygen every hour; 3,000 cc. of 5 per cent dextrose and saline solution was given intravenously at the rate of 300 cc. an hour over night, and the patient excreted 325 cc. of urine. On the morning of the 12th the patient's condition was very satisfactory; the pulse was 110, respiration 24, blood pressure 148/82, temperature 100. There had been no nausea, and the return from continuous suction of the stomach was negligible. The chest was negative to a limited examination. At noon the patient began to cough and became cyanotic, voiding involuntarily. At 4 p. m. the chest was full of coarse râles and resonance was impaired throughout the entire right lung; there was no change in the position of the heart. The pulse rate was 140, respiration 28, temperature 103. Roentgen examination showed cloudy infiltration and mottling throughout the entire right lung, and questionable infiltration of the hilus area of the left lung; these were considered to be signs of bronchial pneumonia. Bile was coming through the Pezzar catheter at this time. The usual treatment with oxygen and digifolin was unavailing, and the patient died at 12:25 p. m., February 13.

Autopsy.—This was limited to the abdomen and was performed at once. The suture line around the Pezzar catheter in the gallbladder was intact, as was the suture line closing the tear in the gallbladder, and there was no sign of bleeding from either the liver bed or from the gallbladder itself. A few clots were found in the flanks and on the diaphragmatic surface of the liver. Liver, gallbladder, and common bile duct were removed *en masse* and taken to Dr. I. Y. Olch in the surgical pathologic laboratory of the Washington University School of Medicine, who made the pathologic examination.

The material consisted of the liver and gallbladder removed at necropsy. A long Pezzar catheter was in the gallbladder and was held in place by a purse-string suture at the fundus. The gallbladder had been separated from its bed on the right and the quadrate lobes of the liver. Along the right margin of separation was a line of sutures holding together the gallbladder, where it was found at operation to be perforated into the free peritoneal cavity. This suture line appeared intact. The gallbladder measured 8 by 3 by 3 cm. and contained no stones, although stones were said to have been present at operation. The serosa was rough, it was red, the walls were thickened to 5 mm. and the mucosa was hemorrhagic and edematous. No stones were found on dissection of the valves of Heister and of the cystic duct. The hepatic duct was free of stones. The liver looked normal. The gross diagnosis was recent perforation of a gallbladder that was acutely inflamed and contained stones.

On microscopic examination a section showed a thick gallbladder wall, which was markedly edematous. The mucosa was absent, probably postmortem autolysis. Another section showed liver in which there was extensive central necrosis with considerable blood in the sinusoids in the midzonal areas.

The diagnosis was cholelithiasis; chronic cholecystitis.

COMMENT

The midzonal necrosis of the liver described microscopically was thought to be due to the terminal fever accompanying the fatal pneumonia. Since the gallbladder was not grossly thickened or edematous at operation, the postmortem condition in the gallbladder was due, we believe, to the presence of the Pezzar catheter during the forty hours that elapsed from operation until death. It seems to us that vomiting, associated with the onset of pain in the present illness, increased the intra-abdominal tension to such an extent that the thin wall of the gallbladder was pressed on its tightly packed content of sharply faceted stones with sufficient force to produce a tear through the wall and subsequent unchecked hemorrhage. An effort was made to dissect out the cystic artery in the surgical pathologic laboratory, but it proved to be so small that this was not practical. Its many branches were not located in the vicinity of the rent in the gallbladder.

508 North Grand Boulevard.

3. Bartlett, Willard, Jr.: Am. J. Surg. **23**: 484 (March) 1934.

CONTRAST STAIN FOR THE RAPID IDENTIFICATION OF TRICHOMONAS VAGINALIS

JAMES RAGLAN MILLER, M.D., HARTFORD, CONN.

The use of the hanging drop or wet smear under a cover glass for the identification of Trichomonas vaginalis occasionally offers difficulties when the organisms are few or when their motility is temporarily suspended. I have found that a drop of 0.1 per cent safranin is useful as a diluent for the pus that is to be examined. Not only the nuclear material but protoplasm also of the leukocytes rapidly takes safranin stain, whereas the Trichomonas vaginalis organism remains unstained and conspicuous as a clear object against a slightly pink background.

It is noticeable also that the safranin, at least in this dilution, does not interfere with the motility shown by Trichomonas; if anything, it appears to stimulate it. Under the low power it is often possible more quickly to pick out areas where the organisms are numerous, so that identification with the high power objective can be quickly effected.

179 Allyn Street.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

PAUL NICHOLAS LEECH, Secretary.

EPHEDRITONE INHALANT-MASSEY'S NOT ACCEPTABLE FOR N. N. R.

Under the name "Ephedritone Inhalant," the Massey Laboratories, Inc., Nashville, Tenn., presented for the Council's consideration a preparation stated to contain 1 per cent each of ephedrine and chlorbutanol in an aromatic base, proposed for use "in congested conditions of the mucous membranes." The aromatic base is stated to contain a "stabilized vegetable oil" the nature of which was not specified. The Council accepts no product the composition of which is not adequately declared. In this case this requirement is of special importance in view of the possible presence in the oil of aldehydes that may be incompatible with ephedrine.

In the submitted advertising occurs the statement:

"Clinical tests made by leading specialists prove that the synergistic effects of Ephedrine and Chloretone give a prolonged contraction of capillaries and prolonged reduction of swollen turbinates *without irritation.*"

The Council is not aware of any convincing evidence that there is synergistic action between the two drugs. Instead of the vague reference to tests by "leading specialists," the firm should submit such evidence if it is available.

Perhaps the chief objection to this product from the Council's point of view is the use of the coined proprietary name Ephedritone for an unoriginal mixture of well known drugs. Fundamentally this objection is based on the fact that such names are not informative to the physician who prescribes; their use creates a multiplicity of names for the same medicament. "Ephedritone" also carries a therapeutic suggestion, a fact that considerably aggravates its offense to rational therapeutics. In practice it has been found that such names facilitate injudicious and harmful self medication by the public. The physician prescribes the mixture for a given condition, the name sticks easily in the patient's mind, and the next time he or a friend has an ailment that seems similar, another bottle is obtained at the drug store and unknown symptoms may go untreated or contraindicated treatment may be given to other existing symptoms.

Although it has been informed of the Council's objections to the product for more than a year, the firm has taken no steps to make it acceptable. The Council voted therefore to declare Ephedritone Inhalant-Massey's unacceptable for inclusion in New and Nonofficial Remedies, and authorized publication of this report.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

SUPRARENIN (See New and Nonofficial Remedies, 1935, p. 206).

The following dosage form has been accepted:

Ampules Suprarenin Powder, 0.05 Gm.: Each ampule contains suprarenin bitartrate 0.091 Gm., equivalent to suprarenin 0.05 Gm.

NEODIARSENOL (See New and Nonofficial Remedies, 1935, p. 78).

The following dosage form has been accepted:

Neodiarsenol, 1.8 Gm. Ampoules.

RABIES VACCINE (See New and Nonofficial Remedies, 1935, p. 380).

United States Standard Products Company, Woodworth, Wis.

Rabies Vaccine (Killed Virus) Semple (U. S. S. P. Co.). (See New and Nonofficial Remedies, 1935, p. 384).—Also supplied in the form of a 25 per cent suspension of brain substance containing 0.5 per cent of phenol. Marketed in packages of seven and fourteen vials each containing a single dose (0.5 cc.).

NORMAL HORSE SERUM (See New and Nonofficial Remedies, 1935, p. 364).

The National Drug Co., Philadelphia.

Normal Horse Serum (See New and Nonofficial Remedies, 1935, p. 365).—Also marketed in packages of one 10 cc. vial, and in packages of one 100 cc. double ended vial, complete with intravenous outfit. One cc. of a 10 per cent dilution is included with each package for determining sensitivity of the patient by scratch or intradermal test.

Committee on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

FRANKLIN C. BING, Secretary.

1. ALLERTON FARM BRAND EVAPORATED MILK
2. KOPPERS STORES BRAND EVAPORATED MILK

Distributors.—1. Pittsburgh Provision & Packing Company, Pittsburgh. 2. Koppers Stores, Inc., Pittsburgh.

Packer.—Armour & Company, Chicago.

Description.—The procedure of evaporation and canning, and the analysis are essentially the same as for the usual evaporated milk (THE JOURNAL, April 16, 1932, p. 1376).

CELLU BRAND SPINACH, WATER PACKED

Distributor.—Chicago Dietetic Supply House, Inc., Chicago.

Packer.—Kings County Packing Company, Armona, Calif.

Description.—Canned spinach, packed in water.

Manufacture.—Spinach at the proper degree of maturity is trimmed, thoroughly washed, blanched, drained and packed in cans. The cans are filled with water, heated, sealed and processed.

Analysis (submitted by distributor).—

	per cent
Moisture	93.4
Total solids	6.6
Ash	0.8
Fat (ether extract)	0.4
Protein (N × 6.25)	2.1
Crude fiber	0.9
Starch (diastase method)	1.7
Carbohydrates other than crude fiber (by difference)	2.4

Calories.—0.2 per gram; 6 per ounce.

Claims of Manufacturer.—Choice quality spinach packed without added sugar or salt. For use in special diets in which sugar or salt is proscribed or in quantitative diets of calculated composition.

MEYENBERG ALL PURE BRAND EVAPORATED MILK

Manufacturer.—Meyenberg Milk Products Company, Salinas, Calif.

Description.—Unsweetened, sterilized, evaporated milk.

Manufacture.—Milk from farms under government supervision is inspected, filtered, evaporated, homogenized, cooled, standardized for milk-fat and total solids, automatically filled into cans, sealed and sterilized.

Analysis (submitted by manufacturer).—

	per cent
Moisture	73.4
Total solids	26.6
Ash	1.5
Fat (ether extract)	7.9
Protein (N × 6.38)	8.3
Lactose (by difference)	8.9

Calories.—1.4 per gram; 40 per ounce.

Claims of Manufacturer.—See announcement of acceptance of Evaporated Milk Association, Educational Advertising (THE JOURNAL, Dec. 19, 1931, p. 1890).

RADIOLOGIC SERVICE IN THE UNITED STATES

REPORT BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

The names of 1,274 physicians specializing in radiology are included in this, the sixth publication of the Council's list.

The type of service rendered is given opposite the name. "Radiology," under "Type of Service," always includes short wave therapy, also known as "deep therapy." The asterisk (*) on "Roentgenology" indicates that short wave therapy is included.

The publication of this list in this issue completes the duty assigned to the Council of preparing a list of radiologists. This function is now being transferred to the American Board of Radiology, which was approved by the Council on Medical Education and Hospitals, Dec. 9, 1935. Many radiologists did not apply to the Council in anticipation of the formation of the Board. Recent applicants have been referred to the Board. Therefore the list on the following pages contains few additions and changes.

The list of the Board's diplomates to Jan. 1, 1936 appears in "Radiology" for January 1936.

The Board will conduct examinations in May and September of the present year. Appointments for examination are made through Dr. B. R. Kirklin, Secretary, American Board of Radiology, Rochester, Minn.

PHYSICIANS SPECIALIZING IN RADIOLOGY

ALABAMA

NAME	ADDRESS	TYPE OF SERVICE
Anniston		
Levi, Irwin P.	931 Noble St.	Roentgenology
Birmingham		
Barfield-Carter, M.	1929, 1st Ave. N.	Roentgenology
Kesmodel, Karl F.	1023 S. 20th St.	Radiology
Meadows, James A.	1023 S. 20th St.	Radiology
Sorrell, Lewis E.	2501, 16th St.	Roentgenology *
Dothan		
Ellis, John T.	200 E. Main St.	Roentgenology
Fairfield		
Troje, Oscar R.	Tenn. Coal, Iron & R. R. Co. Employees' Hosp.	Radiology
Montgomery		
Boswell, F. P.	201 Montgomery St.	Radiology

ARIZONA

NAME	ADDRESS	TYPE OF SERVICE
Phoenix		
Goss, H. L.	125 W. Monroe St.	Roentgenology
Watkins, W. Warner	15 E. Monroe St.	Radiology
Tucson		
Hayden, Edward M.	2039 E. 1st St.	Diagnostic roent.

ARKANSAS

NAME	ADDRESS	TYPE OF SERVICE
Fort Smith		
Brooksher, W. R.	602 Garrison Ave.	Radiology
Hot Springs		
Nims, Chas. H.	236 Central Ave.	Radiology
Little Rock		
Rhinehart, Barton A.	701 Main St.	Roentgenology
Rhinehart, D. A.	701 Main St.	Roentgenology
Zell, A. M.	2000 Main St.	Radiology
Monticello		
Wilson, J. S.		Radiology

CALIFORNIA

NAME	ADDRESS	TYPE OF SERVICE
Alameda		
Lum, Wm. T.	1361 Park St.	Roentgenology *
Bakersfield		
Fox, L. H.	2025, 18th St.	Roentgenology
Berkeley		
Heald, E. Schulze	3000 Regent St.	Roentgenology
Van Nuys, R. G.	2490 Channing Way	Radiology
Eureka		
Woolford, Joseph S.	350 E St.	Roentgenology
Fresno		
McGehee, W. H.	2014 Tulare St.	Diagnostic roent.
Milholland, W. G.	1001 Fulton St.	Roentgenology
Ruff, Frank R.	1234 S St.	Radiology
Glendale		
Ghrist, David M.	143 N. Brand Blvd.	Radiology
Jones, L. L.	229 N. Central Ave.	Roentgenology *
Hollywood		
Sherman, Benj. H.	6777 Hollywood Blvd.	Roentgenology
Stewart, Chas. W.	1680 N. Vine St.	Roentgenology
Warren, J. W.	1322 N. Vermont Ave.	Radiology
Long Beach		
Heylmun, H. H.	117 E. 8th St.	Diagnostic roent.
Mayfield, Claude	117 E. 8th St.	Diagnostic roent.
Los Angeles		
Abowitz, Jacob	4833 Fountain Ave.	Roentgenology
Bailey, Cornelius O.	727 W. 7th St.	Radiology
Blaine, Edward S.	727 W. 7th St.	Roentgenology
Bonoff, Karl M.	1930 Wilshire Blvd.	Roentgenology
Carter, Ray A.	1200 N. State St.	Roentgenology
Costolow, Wm. E.	1407 S. Hope St.	Roentgen therapy Radium therapy
Davis, Kenneth S.	2131 W. 3d St.	Roentgenology *
Goin, Lowell S.	1930 Wilshire Blvd.	Roentgenology
Johnson, Clayton R.	1200 N. State St.	Diagnostic roent.
Karshner, Rolla G.	510 S. Lucas Ave.	Roentgenology
Kibby, Sidney V.	727 W. 7th St.	Roentgenology
King, Cecil V.	736 S. Flower St.	Radiology
Liljedahl, Elmer N.	1241 Shatto St.	Roentgenology *
MacColl, Douglass R.	2007 Wilshire Blvd.	Roentgenology *
Pindell, Merl Lee	678 S. Ferris Ave.	Diagnostic roent.
Snure, Henry	1414 S. Hope St.	Radiology
Soiland, Albert	1407 S. Hope St.	Roentgen therapy Radium therapy
Stafford, Owen R.	520 W. 7th St.	Roentgenology
Taylor, Raymond G.	1212 Shatto St.	Radiology
Witter, Calvin B.	511 S. Bonnie Brae St.	Roentgenology *
Oakland		
Bissell, Frank S.	1624 Franklin St.	Roentgenology
Bowen, Carl B.	1624 Franklin St.	Roentgenology
Jelte, S. A.	230 Grand Ave.	Radiology
Petch, Philip H.	426, 17th St.	Roentgenology
Peters, Chas. E.	400, 29th St.	Roentgenology *
Sargent, Wm. H.	Hawthorne Ave. and Webster St.	Roentgenology *
Siefert, Alfred C.	411, 30th St.	Radiology
Palo Alto		
Powers, Robert A.	261 Hamilton Ave.	Roentgenology
Starks, Dorothy J.	261 Hamilton Ave.	Radiology
Pasadena		
Chapman, John Frye	65 N. Madison Ave.	Roentgenology *
Parker, Carl H.	65 N. Madison Ave.	Roentgenology *
Pomona		
Swearingen, F. C.	586 N. Main St.	Radiology
Redlands		
Folkins, F. H.	47 E. Vine St.	Roentgenology
Riverside		
Thuresson, Paul F.	3770, 12th St.	Diagnostic roent.
Sacramento		
Briggs, Rowland S.	1014, 8th St.	Radiology
Cook, Orrin S.	1127, 11th St.	Roentgenology
Graham, Ralph S.	2830 L St.	Roentgenology *
Lawson, John D.	926 J St.	Radiology
Zimmerman, Harold	1027, 10th St.	Radiology
San Bernardino		
Owen, C. C.	398, 6th St.	Roentgenology *
San Diego		
Kinney, L. C.	1831, 4th St.	Radiology
Weiskotten, W. O.	233 A St.	Diagnostic roent.
San Francisco		
Bryan, Lloyd	450 Sutter St.	Roentgenology *
Capp, Charles S.	Parnassus and 3rd Aves.	Radiology
Crow, Lloyd B.	1431 Geary St.	Roentgenology *
Donovan, Monica	450 Sutter St.	Roentgenology Radium therapy
Fulmer, Chas C.	27th and Valencia Sts.	Roentgenology
Garland, L. Henry	450 Sutter St.	Roentgenology *
Hunsberger, H. S.	450 Sutter St.	Diagnostic roent.
Ingber, I. S.	490 Post St.	Radiology
Leef, Edward	2361 Clay St.	Radiology
Levitin, Joseph	516 Sutter St.	Radiology
Newell, Robert R.	2361 Clay St.	Radiology
O'Neill, John R.	2200 Hayes St.	Roentgenology
Rice, Frank M.	2000 Van Ness Ave.	Roentgenology *
Rodenbaugh, F. H.	490 Post St.	Radiology
Ruggles, Howard E.	384 Post St.	Roentgenology
Stone, Robert S.	Parnassus and 3d Aves.	Roentgenology *
Williams, A. J.	450 Sutter St.	Radiology
Williams, Francis	870 Market St.	Radiology
San Jose		
Broemser, Milton A.	311 S. 1st St.	Radiology
Bullitt, James B.	241 E. Santa Clara St.	Radiology
Richards, Charles M.	241 E. Santa Clara St.	Radiology
Santa Barbara		
Gates, Russell	1520 Chapala St.	Roentgenology
San Pedro		
Allen, Albert	410 W. 6th St.	Diagnostic roent.
Santa Barbara		
Clark, Daniel M.	1520 Chapala St.	Diagnostic roent.
Geyman, M. J.	1520 Chapala St.	Radiology

NAME	ADDRESS	TYPE OF SERVICE
Ullmann, H. J.	1520 Chapala St.	Radiology
Ware, James G.	1513 State St.	Roentgenology *
Santa Monica		
Hopkirk, C. C.	710 Wilshire Blvd.	Diagnostic roent.
Stockton		
McGurk, Raymond T.	242 N. Sutter St.	Roentgenology *
Sheldon, F. B.	242 N. Sutter St.	Radiology
COLORADO		
Colorado Springs		
Brown, L. Gordon	707 N. Cascade Ave.	Radiology
Denver		
Allen, K. D. A.	227, 16th St.	Roentgenology *
Bouslog, John S.	227, 16th St.	Radiology
Brandenburg, H. P.	227, 16th St.	Radiology
Childs, S. B.	227, 16th St.	Radiology
Crosby, L. G.	227, 16th St.	Radiology
Diemer, Frederick E.	1612 Tremont Pl.	Diagnostic roent.
Newcomer, Elizabeth	1612 Tremont Pl.	Roentgenology *
Newcomer, N. B.	1612 Tremont Pl.	Radiology
Schmidt, Ernst A.	4200 E. 9th Ave.	Radiology
Stephenson, F. B.	227, 16th St.	Roentgenology
Wasson, W. W.	227, 16th St.	Radiology
Weeks, Paul R.	227, 16th St.	Roentgenology
Withers, Sanford.	1612 Tremont Pl.	Roentgenology Radium therapy
Longmont		
Matlack, J. A.		Diagnostic roent.
Sterling		
Daniel, J. H.		Roentgenology
Woodmen		
Forney, F. A.		Diagnostic roent.
CONNECTICUT		
Bridgeport		
Groark, Owen J.	881 Lafayette St.	Diagnostic roent.
Lockhart, R. Harold.	144 Golden Hill St.	Radiology
Parmelee, B. M.	144 Golden Hill St.	Radiology
Hartford		
Butler, Nicholas G.	50 Farmington Ave.	Roentgenology
Climan, Max.	242 Trumbull St.	Diagnostic roent.
Hoffman, Charles C.	700 Main St.	Diagnostic roent.
Ogden, Ralph T.	179 Allyn St.	Radiology
Roberts, Douglas J.	179 Allyn St.	Radiology
Van Strander, W. H.	179 Church St.	Radiology
Meriden		
Otis, Fessendon N.	165 W. Main St.	Roentgenology
Middletown		
Murphy, James	101 Broad St.	Radiology
New Britain		
Grant, Arthur S.	55 W. Main St.	Roentgenology
Loud, Norman W.	92 Grand St.	Diagnostic roent.
New Haven		
Bergman, A. P.	27 Elm St.	Diagnostic roent.
Goldman, George	201 Park St.	Diagnostic roent.
Scott, Clifton R.	215 Whitney Ave.	Roentgenology
Wheatley, Louis F.	420 Temple St.	Roentgenology *
Norwalk		
Perkins, Charles W.	520 West Ave.	Roentgenology *
Waterbury		
Atkins, Samuel M.	111 W. Main St.	Roentgenology *
Harvey, Joseph L.	64 Robbins St.	Roentgenology *
Willimantic		
Kinney, Kenneth K.	29 North St.	Roentgenology
DELAWARE		
Wilmington		
Allen, B. M.	909 Washington St.	Diagnostic roent.
Burns, Ira	912 Jefferson St.	Radiology
McElfatrick, G. C.	1024 W. 8th St.	Diagnostic roent.
DISTRICT OF COLUMBIA		
Washington		
Bierman, M. I.	1801 Eye St. N.W.	Diagnostic roent.
Caylor, C. C.	1029 Vermont Ave. N.W.	Diagnostic roent.
Christie, A. C.	1835 Eye St. N.W.	Radiology
Coe, Fred O.	1835 Eye St. N.W.	Radiology
Eldridge, W. W., Jr.	Nichols Ave. S.E.	Roentgenology *
Elward, Joseph F.	1726 Eye St. N.W.	Roentgenology
Groover, T. A.	1835 Eye St. N.W.	Radiology
Lattman, Isidore	1835 Eye St. N.W.	Radiology
Leibell, Casimir	1029 Vermont Ave. N.W.	Radiology
McPeak, Edgar M.	1835 Eye St. N.W.	Radiology
Merritt, E. A.	1835 Eye St. N.W.	Radiology
Moore, A. B.	1835 Eye St. N.W.	Radiology
Moore, Claude	815 Connecticut Ave. N.W.	Roentgenology
Otell, L. S.	1835 Eye St. N.W.	Radiology
Sappington, E. F.	1103, 16th St. N.W.	Roentgenology
FLORIDA		
Fort Lauderdale		
Hendricks, E. M.	314 Sweet Bldg.	Radiology
Jacksonville		
McEuen, H. B.	126 W. Adams St.	Roentgenology *
Shaw, W. McL.	117 W. Duval St.	Roentgenology *
Mandarin		
Cunningham, Lester W.		Roentgenology
Miami		
Cleghorn, Charles D.	168 S.E. 1st St.	Roentgenology Radium therapy
Lucinian, Joseph H.	168 S.E. 1st St.	Roentgenology *
Pearson, Nelson T.	168 S.E. 1st St.	Roentgenology
Raap, Gerard.	168 S.E. 1st St.	Diagnostic roent. Radium therapy
Miami Beach		
Payton, Frazier J.	63d St. and Collins Ave.	Roentgenology Radium therapy
Ocala		
Moore, J. N.		Diagnostic roent.
Orlando		
Pines, John A.	108 E. Central Ave.	Roentgenology *
Weed, Walter A.	307 S. Orange Ave.	Radiology
St. Petersburg		
Feaster, O. O.	11th St. and 7th Ave. N.	Radiology
Herring, John A.	342, 3d Ave. N.	Diagnostic roent.
Tampa		
Allen, Bundy.	706 Franklin St.	Roentgenology *
Brown, Harold O.	215 Madison St.	Roentgenology
Dickinson, J. C.	706 Franklin St.	Roentgenology *
West Palm Beach		
Herpel, Fredk. K.	Good Samaritan Hospital	Diagnostic roent.
GEORGIA		
Americus		
Pendergrass, R. C.		Roentgenology *
Atlanta		
Clark, James J.	478 Peachtree St. N.E.	Roentgenology *
Hall, O. D.	450 East Ave.	Radium therapy
Lake, Wm. F.	384 Peachtree St. N.E.	Roentgenology *
Landham, J. W.	139 Forrest Ave. N.E.	Roentgenology Radium therapy
Rayle, Albert A.	44 Broad St. N.W.	Roentgenology
Stewart, Calvin B.	904 Peachtree St.	Radium therapy
Augusta		
Holmes, L. P.	753 Broad St.	Roentgenology
Savannah		
Cole, Wm. A.	24 E. Taylor St.	Roentgenology
Corson, Eugene R.	10 W. Jones St.	Roentgenology *
Drane, Robert.	Liberty and Drayton Sts.	Roentgenology Radium therapy
McGee, H. H.	346 Bull St.	Roentgenology
Thomasville		
Collins, J. J.	901 Gordon Ave.	Radiology
IDAHO		
Boise		
Genoway, Charles V.	105 N. 8th St.	Roentgenology *
Lewiston		
Johnson, Paul W.		Roentgenology *
ILLINOIS		
Batavia		
Mostrom, H. T.		Diagnostic roent. Radium therapy
Bloomington		
Cantrell, Thomas D.	310 E. Jefferson St.	Radiology
Grote, Henry W.	219 N. Main St.	Radiology
Rypins, Edwin L.	102 E. Jefferson St.	Radiology
Chicago		
Anspach, Wm. E.	1150 N. State St.	Radiology
Arens, Robt. A.	2839 Ellis Ave.	Radiology
Bauer, August A.	1305 E. 63d St.	Roentgenology
Beilin, David S.	411 Garfield Ave.	Radiology
Blackmarr, Frank H.	25 E. Washington St.	Roentgen therapy Radium therapy
Brams, Julius.	55 E. Washington St.	Radiology
Braun, Benjamin D.	25 E. Washington St.	Radiology
Brown, Wm. L.	55 E. Washington St.	Radium therapy
Case, James T.	180 N. Michigan Ave.	Radiology
Challenger, Chester J.	3117 Logan Blvd.	Roentgenology
Cook, Carroll E.	30 N. Michigan Ave.	Radiology
Culpepper, Wm. L.	1180 E. 63d St.	Roentgenology
Cushway, B. C.	7752 S. Halsted St.	Radiology
Cutrera, Peter.	1200 Gilpin Pl.	Diagnostic roent.
Damiani, Joseph.	767 Milwaukee Ave.	Roentgenology
Davis, H. E.	180 N. Michigan Ave.	Radiology
Dick, Paul G.	55 E. Washington St.	Roentgenology
Foley, Joseph M.	1439 S. Michigan Ave.	Roentgenology *
Ford, Charles.	8017 Luella Ave.	Roentgenology
Grubbe, Emil H.	6 N. Michigan Ave.	Roentgen therapy
Hartung, Adolph.	55 E. Washington St.	Radiology
Herman, Edward R.	6319 S. Halsted St.	Roentgenology *
Hodges, Paul C.	950 E. 59th St.	Radiology
Hubeny, M. J.	25 E. Washington St.	Roentgenology
Jenkinson, David L.	1931 Wilson Ave.	Roentgenology *
Jenkinson, E. L.	1439 S. Michigan Ave.	Radiology
Kaplan, Maurice I.	3837 W. Roosevelt Rd.	Radiology
Kitterman, Peter G.	6319 S. Halsted St.	Roentgenology
Landau, George M.	660 Groveland Park.	Roentgenology
Larkin, A. James.	180 N. Michigan Ave.	Radium therapy
Litschgi, Joseph J.	551 Grant Pl.	Roentgenology
Maier, Roe J.	7752 S. Halsted St.	Radiology
Olin, Harry A.	6060 Drexel Blvd.	Roentgenology
Orndoff, B. H.	2561 N. Clark St.	Radiology
Potter, Hollis E.	122 S. Michigan Ave.	Roentgenology
Richman, Samuel H.	1850 W. Harrison St.	Roentgenology *
Rose, Cassie Belle.	1753 W. Congress St.	Radiology
Royer, Don J.	841 E. 63d St.	Roentgenology
Simpson, Frank E.	59 E. Madison St.	Radium therapy
Tichy, L. S.	3200 W. Cermak Rd.	Roentgenology
Trostler, I. S.	25 E. Washington St.	Radiology
Walt, Harold Nathan.	3821 Washington Blvd.	Roentgenology
Wanninger, W. J.	9116 Exchange Ave.	Roentgenology
Warden, R. H.	1044 N. Francisco Ave.	Radiology
Warfield, C. H.	1850 W. Harrison St.	Roentgenology
Willy, R. G.	1138 N. Leavitt St.	Roentgenology

NAME	ADDRESS	TYPE OF SERVICE
Danville		
Archibald, James S.	602 Green St.	Roentgenology
Dunham, L. H.	41 N. Vermilion St.	Radiology
Decatur		
Flinn, Fauntleroy	220 S. Webster St.	Radiology
Deerfield		
Davis, Charles J.		Roentgenology
East St. Louis		
Echternacht, A. C.	234 Collinsville Ave.	Radiology
Evanston		
Conley, Bernard M.	565 Howard St.	Roentgenology
Crowder, Earl R.	2650 Ridge Ave.	Roentgenology *
Ledoux, Alfred C.	355 Ridge Ave.	Roentgenology
Perry, Gentz.	636 Church St.	Radiology
Highland Park		
Jacks, R. R.	2 N. Sheridan Rd.	Diagnostic roent.
Jacksonville		
Brouse, Ivan E.	316 W. State St.	Roentgenology *
Joliet		
Houston, Alfred M.	106 N. Chicago St.	Roentgenology
La Grange		
McClure, C. F.		Roentgenology
Lincoln		
Hagans, Frank M.	400 Broadway	Radium therapy
Mattoon		
Morgan, Chas. E.	213 S. 17th St.	Roentgenology
Mount Carmel		
Elkins, Harold A.		Roentgenology
Mount Vernon		
Smith, Elmer M.	1001½ Broadway	Roentgenology
Oak Park		
Ronayne, Frank J.	518 N. Austin Blvd.	Radiology
Olney		
Weber, James A.	R. D. 4	Diagnostic roent. Radium therapy
Ottawa		
Pettit, Roswell T.	728 Columbus St.	Radiology
Peoria		
Decker, Fred H.	410 Main St.	Radiology
Goodwin, P. B.	530 N. Glen Oak Ave.	Radiology
Magee, H. B.	410 Main St.	Radiology
Quincy		
Beirne, H. P.	646 Hampshire St.	Roentgenology Radium therapy
Perley, Arthur E.	510 Maine St.	Radiology
Swanberg, Harold.	510 Maine St.	Radiology
Rockford		
Ackermann, H. W.	321 W. State St.	Radiology
Springfield		
Hilt, Lawrence M.	107 S. 5th St.	Roentgenology *
O'Hara, F. S.	403 E. Capitol Ave.	Radiology

INDIANA

Evansville		
Cleveland, W. R.	24 N.W. 4th St.	Radiology
Meyer, Keith T.	600 Mary St.	Diagnostic roent.
Fort Wayne		
Rodriguez, Juan.	2902 Fairfield Ave.	Radiology
Van Buskirk, E. M.	347 W. Berry St.	Radiology
Frankfort		
Chittick, A. G.	206 E. Walnut St.	Roentgenology
Gary		
Dietrich, Paul H.	540 Tyler St.	Roentgenology
Sagel, Jacob.	1600 W. 6th Ave.	Radiology
Hammond		
Rauschenbach, C. W.	5245 Hohman Ave.	Roentgenology
Indianapolis		
Beeler, Raymond C.	23 E. Ohio St.	Radiology
Collins, James N.	23 E. Ohio St.	Radiology
Lochry, R. L.	Fall Creek Blvd. and Illinois St.	Roentgenology
Smith, Lester A.	23 E. Ohio St.	Radiology
Stayton, Chester A.	23 E. Ohio St.	Roentgenology *
Wright, Cecil S.	1040 W. Michigan St.	Radiology
Kokomo		
Ferry, Paul W.	224 N. Main St.	Diagnostic roent.
LaFayette		
McClelland, D. C.	308 N. 8th St.	Roentgenology *
Sichler, Harper G.	2400 South St.	Roentgenology
Michigan City		
Martin, F. V.	127 E. 5th St.	Radiology
Muncie		
Moore, P. D.	Jackson and High Sts.	Radiology
New Castle		
Iterman, Geo. E.	1319 Church St.	Roentgenology
Plymouth		
Knott, Harry.		Roentgenology
Shelbyville		
Inlow, Herbert H.	18 W. Washington St.	Diagnostic roent.
South Bend		
Fisher, Lawrence F.	105 E. Jefferson Blvd.	Roentgenology *
Terre Haute		
Pierce, H. J.	627 Cherry St.	Radiology
Union City		
Reid, Robert W.		Roentgenology
Valparaiso		
DeWitt, C. H.		Diagnostic roent.
Vincennes		
Moore, Robert G.	21 N. 3d St.	Roentgenology

IOWA

Anamosa		
Rawson, E. G.		Diagnostic roent.
Atlantic		
Greenleaf, W. S.		Roentgenology
Belle Plaine		
Newland, Don H.		Diagnostic roent.
Boone		
Whitaker, B. T.	703, 8th St.	Radiology
Cedar Rapids		
Erskine, Arthur W.	120, 3d Ave. S.E.	Radiology
Clinton		
Knudsen, Hubert K.	419 S. 2d St.	Roentgenology *
Lenaghan, Robt. T.	2405 N. 2d St.	Roentgenology
Council Bluffs		
Hawkins, Emmet L.	420 E. Washington Ave.	Radiology
Des Moines		
Burcham, Thos. A.	406, 6th Ave.	Radiology
Dubuque		
Ericksen, Lester G.	1596 Delhi St.	Roentgenology
Eagle Grove		
Christensen, John R.		Roentgenology
Iowa City		
Gillies, Carl L.	University Hospital	Radiology
Kerr, H. Dabney	University Hospital	Radiology
LeMars		
Larsen, W. W.		Roentgenology *
Marshalltown		
Talley, Louis F.	Main St. and 3d Ave.	Roentgenology
Ottumwa		
Spilman, H. A.	101 S. Market St.	Diagnostic roent.
Webb, Harold H.	117 E. Main St.	Roentgenology *
Sioux City		
Gibbon, W. H.	423, 6th St.	Radiology
Waterloo		
Britt, Otis W.	525 Sycamore St.	Radiology
Kestel, John L.	525 Sycamore St.	Radiology

KANSAS

Beloit		
Vallette, H. B.		Diagnostic roent.
Eldorado		
Dinsmore, W. S.	324 W. Central Ave.	Diagnostic roent.
Fort Scott		
Prichard, J. R.	209 S. Main St.	Radiology
Kansas City		
Allen, Lewis G.	905 N. 7th St.	Radiology
Tice, Galen M.	39th and Rainbow Blvd.	Radiology
Lawrence		
Jones, H. T.	107 E. 8th St.	Diagnostic roent.
Salina		
Brittain, O. R.	105 S. 7th St.	Roentgenology
Topeka		
Finney, Guy A.	901 Kansas Ave.	Roentgenology
Floersch, M. A.	700 Kansas Ave.	Roentgenology
Owen, Arthur K.	901 Kansas Ave.	Roentgenology
Wichita		
Frost, E. J.	227 E. Douglas Ave.	Radiology
Swope, Opie W.	105 N. Main St.	Radiology
Webb, J. A. H.	106 N. Main St.	Radiology

KENTUCKY

Ashland		
Cooper, John Ralph	1540 Winchester Ave.	Roentgenology *
Lexington		
Harding, Donnan B.	190 N. Upper St.	Radiology
Thompson, J. Campbell.	201 W. Short St.	Roentgenology
Louisville		
Bell, J. C.	332 W. Broadway	Radiology
Enfield, Chas. D.	332 W. Broadway	Radiology
Fugate, I. T.	608 S. 4th St.	Radiology
Herrmann, Henry C.	321 W. Broadway	Radiology
Johnson, Sydney E.	101 W. Chestnut St.	Roentgenology
Keith, D. Y.	412 W. Chestnut St.	Radiology
Keith, J. P.	412 W. Chestnut St.	Radiology
Martin, William C.	321 W. Broadway	Roentgenology
Owensboro		
Gillim, P. D.	1001 Pearl St.	Roentgenology
Shelbyville		
Bayless, B. W.		Roentgenology
Winchester		
Browne, I. H.		Diagnostic roent.

LOUISIANA

Alexandria		
Barker, H. O.	327, 3d St.	Roentgenology
Baton Rouge		
Williams, Lester J.	251, 3d St.	Radiology
Houma		
St. Martin, T. I.		Roentgenology

NAME	ADDRESS	TYPE OF SERVICE
Mansfield		
Curtis, H. P. D.		Roentgenology
Monroe		
Moore, Daniel M.	128 De Siard St.	Roentgenology
New Orleans		
Ané, J. Novell.	921 Canal St.	Roentgenology Radium therapy
Bowie, E. R.	3503 Prytania St.	Radiology
Fortier, L. A.	2000 Tulane Ave.	Radiology
Gately, T. T.	2000 Tulane Ave.	Radiology
Granger, Amédée	210 Baronne St.	Roentgenology
Magruder, L. W.	2700 Napoleon Ave.	Radiology
Menville, L. J.	921 Canal St.	Radiology
Rodick, John C.	3500 Prytania St.	Roentgenology *
Samuel, E. C.	3503 Prytania St.	Radiology
Teitelbaum, Meyer D.	3500 Prytania St.	Radiology
Shreveport		
Anderson, Johnson R.	1130 Louisiana Ave.	Roentgenology *
Barrow, S. C.	624 Travis St.	Radiology
Edwards, H. G. F.	624 Travis St.	Radiology
Harwell, W. R.	624 Travis St.	Radiology
Rutledge, C. P.	1030 Highland Ave.	Radiology
Thomas, A. Jerome	624 Travis St.	Roentgenology

MAINE

Auburn		
Cunningham, C. H.	66 Goff St.	Diagnostic roent.
Bangor		
Ames, Forrest B.	489 State St.	Roentgenology
Hunt, Barbara	224 State St.	Radiology
Lewiston		
Wilson, S. A.	299 Main St.	Roentgenology
Portland		
Cummings, Edson S.	12 Pine St.	Diagnostic roent.
Lamb, Frank W.	131 State St.	Diagnostic roent.
Thaxter, Langdon T.	22 Arsenal St.	Roentgenology
Waterville		
Goodrich, John P.	214 Main St.	Diagnostic roent.
Lubell, Moses F.	Highwood St.	Roentgenology

MARYLAND

Baltimore		
Ashbury, Howard E.	101 Read St.	Roentgenology *
Burnam, Curtis F.	1418 Eutaw Pl.	Radiology
Evans, John	101 Read St.	Roentgenology
Feldman, Maurice	2425 Eutaw Pl.	Diagnostic roent.
Firor, Whitmer B.	1100 N. Charles St.	Roentgenology *
Hill, Eben C.	N. Broadway and Monument Sts.	Roentgenology
Kahn, Max	2 W. Read St.	Roentgenology *
Ostro, Marcus	1810 Eutaw Pl.	Roentgenology
Pierson, J. W.	1107 St. Paul St.	Roentgenology *
Sax, Benjamin J.	2237 Eutaw Pl.	Diagnostic roent.
Walton, Henry J.	101 Read St.	Roentgenology
Waters, Charles A.	1100 N. Charles St.	Roentgenology *
Wright, Harold E.	101 Read St.	Diagnostic roent.
Crisfield		
Collins, C. E.		Roentgenology
Cumberland		
Cowherd, F. G.	122 S. Centre St.	Roentgenology
Easton		
Hammond, William T.		Roentgenology
Frederick		
Derr, John S.	35 E. Church St.	Roentgenology *
Hagerstown		
Hoffmeier, F. N.	King and Antietam Sts.	Roentgenology
Salisbury		
Williams, Jack K.	203 W. Church St.	Roentgenology

MASSACHUSETTS

Boston		
Blackett, Chas. W.	35 Bay State Rd.	Roentgenology
Bogan, Isabel K.	16 Deaconess Rd.	Roentgenology
Butler, P. F.	35 Bay State Rd.	Radiology
Cleaves, Edwin N.	370 Marlboro St.	Diagnostic roent.
Coffin, W. K.	438 Marlboro St.	Roentgenology
Friedman, Harry F.	270 Commonwealth Ave.	Radiology
George, Arial W.	43 Bay State Rd.	Roentgenology
Hampton, A. O.	Fruit St.	Radiology
Healy, Thomas R.	370 Marlboro St.	Roentgenology *
Holmes, Geo. W.	Fruit St.	Radiology
Leonard, Ralph D.	43 Bay State Rd.	Roentgenology
Levene, George	82 E. Concord St.	Roentgenology *
MacMillan, A. S.	483 Beacon St.	Roentgenology
McCarthy, H. L.	479 Beacon St.	Roentgenology
McFee, William D.	41 Bay State Rd.	Roentgenology
Meachen, John W.	475 Commonwealth Ave.	Roentgenology *
Moloney, Albert M.	47 Bay State Rd.	Radiology
Morrison, Sidney L.	370 Marlboro St.	Roentgenology *
O'Brien, Fredk. W.	463 Beacon St.	Radiology
Osgood, Herman A.	144 Commonwealth Ave.	Roentgenology *
Ott, George J.	344 Commonwealth Ave.	Roentgenology
Perkins, Roy S.	520 Commonwealth Ave.	Roentgenology
Ritvo, Max	485 Commonwealth Ave.	Radiology
Robins, Samuel A.	636 Beacon St.	Roentgenology
Sosman, M. C.	721 Huntington Ave.	Roentgenology *
Vance, R. G.	264 Beacon St.	Roentgenology
Vogt, E. C.	300 Longwood Ave.	Roentgenology
Watts, Henry F. R.	6 Monadnock St., Dor.	Diagnostic roent.
Wheatley, Frank E.	520 Beacon St.	Roentgenology
Whelan, Charles	395 Commonwealth Ave.	Radiology
Brockton		
Packard, Loring B.	680 Center St.	Roentgenology
Dalton		
Sullivan, P. J.		Roentgenology
Fall River		
Tennis, M. N.	538 Prospect St.	Radiology
Haverhill		
Popoff, Constantine	26 Summer St.	Roentgenology *
Sproull, John	50 Merrimack St.	Radiology
Holyoke		
Harrington, Elmer J.	199 Chestnut St.	Roentgenology *
Lawrence		
Burgess, Charles J.	37 Whitman St.	Radiology
Leary, Alfred J.	477 Essex St.	Roentgenology Radium therapy
Lowell		
Stewart, Ralph C.	226 Central St.	Roentgenology
Malden		
Warren, Alva H.	82 Beltran St.	Roentgenology
New Bedford		
Bonnar, James M.	90 Hillman St.	Roentgenology
North Adams		
Bunce, James W.	85 Main St.	Roentgenology
Crawford, J. W.	191 E. Main St.	Radiology
Northampton		
Janes, Benjamin F.	211 Elm St.	Roentgenology
Pittsfield		
Cox, Michael J.	74 North St.	Roentgenology *
Quincy		
Altman, Wm. S.	26 Adams St.	Radiology
Salem		
Tivnan, Paul E.	70 Washington St.	Roentgenology
Somerville		
Blake, Allen H.	81 College Ave., W. Som.	Roentgenology
Springfield		
Davis, Ernest L.	20 Maple St.	Roentgenology *
Horrigan, A. J.	20 Maple St.	Roentgenology *
Jackson, Howard L.	146 Chestnut St.	Roentgenology
Powers, Richard T.	25 Maple St.	Radiology
Solomon, Bennett.	115 State St.	Roentgenology
Van Allen, Harvey W.	19 Maple St.	Radiology
Webster		
Bragg, Leslie R.	260 Main St.	Diagnostic roent.
Worcester		
Cook, Philip H.	27 Elm St.	Roentgenology Radium therapy
Langill, Morton H.	36 Pleasant St.	Roentgenology

MICHIGAN

Adrian		
Chase, A. W.	130 Toledo St.	Diagnostic roent.
Ann Arbor		
Donaldson, Samuel W.	326 N. Ingalls St.	Roentgenology
Hodges, Fred J.	1313 E. Ann St.	Roentgenology
Peirce, Carleton B.	1313 E. Ann St.	Radiology
Battle Creek		
Gorsline, C. S.	25 W. Michigan Ave.	Roentgenology
Kolvoord, Theodore	25 W. Michigan Ave.	Roentgenology
Lanman, Everett L.	Tompkins St. and N. Michigan Ave.	Roentgenology
Upson, W. O.	North Ave. and Emmett St.	Roentgenology
Bay City		
Ziliak, Alois L.	209, 16th St.	Roentgenology *
Detroit		
Berris, J. M.	10 Peterboro St.	Diagnostic roent.
Birkelo, Carl C.	1151 Taylor Ave.	Roentgenology
Bloom, Arthur B.	5057 Woodward Ave.	Roentgenology
Chene, George C.	1553 Woodward Ave.	Roentgenology
Dempster, Jas. H.	5761 Stanton Ave.	Diagnostic roent.
Dickson, B. R.	337 W. Grand Blvd.	Roentgen therapy Radium therapy
Doub, Howard P.	2799 W. Grand Blvd.	Radiology
Eakins, F. J.	1553 Woodward Ave.	Roentgenology
Elsen, Paul	258 S. Algonquin St.	Roentgen therapy Radium therapy
Evans, Wm. A.	10 Peterboro St.	Radiology
Ford, Frances A.	432 E. Hancock Ave.	Radium therapy
Grace, Joseph M.	14729 St. Marys St.	Radiology
Hall, E. Walter	10 Peterboro St.	Radiology
Hasley, Clyde K.	1553 Woodward Ave.	Radiology
Jarre, Hans A.	1553 Woodward Ave.	Radiology
Kenning, J. C.	1553 Woodward Ave.	Roentgenology
Leucutia, Traian	3825 Brush St.	Radiology
Minor, Edward G.	3001 W. Grand Blvd.	Roentgenology
Reynolds, Lawrence	10 Peterboro St.	Radiology
Sanderson, S. E.	5057 Woodward Ave.	Radiology
Shore, O. J.	3001 W. Grand Blvd.	Roentgenology
Stevens, Rollin H.	1553 Woodward Ave.	Radiology
Ulbrich, Henry L.	1122 E. Grand Blvd.	Roentgenology *
Weaver, Clarence E.	113 Martin Pl.	Roentgenology
Wilcox, Leslie F.	10 Peterboro St.	Radiology
Witwer, E. R.	3839 Brush St.	Radiology
Flint		
Clift, Myron W.	900 Begole St.	Radiology
Macduff, R. Bruce	112 W. Kearsley St.	Roentgenology *
Grand Rapids		
Menees, Thomas O.	2062 Wealthy St. S.E.	Radiology
Moore, Vernor M.	110 E. Fulton St.	Radiology
Muller, John H.	26 Sheldon Ave. S.E.	Radiology
Smith, Richard L.	Mich. St. & Bostwick Ave.	Diagnostic roent.
Stonehouse, Garnet G.	26 Sheldon Ave. S.E.	Radiology
Williams, Alden H.	26 Sheldon Ave. S.E.	Radiology

NAME	ADDRESS	TYPE OF SERVICE
Jackson		
Cooley, R. M.	524 Lansing Ave.	Roentgenology
Kugler, J. C.	1905 Grovedale Ave.	Roentgenology
Porter, H. W.	1020 E. Michigan Ave.	Radiology
Kalamazoo		
Crane, A. W.	420 S. Rose St.	Roentgenology *
Jackson, John B.	418 S. Rose St.	Roentgenology *
Lansing		
Davenport, Carroll S.	1210 W. Saginaw St.	Roentgenology *
Huntley, Fred M.	908 N. Capitol Ave.	Roentgenology
Monroe		
Moll, T. M.	120 Maple Blvd.	Diagnostic roent.
Muskegon		
Holly, Leland E.	876 N. 2d St.	Radiology
Plainwell		
Hudnutt, O. D.		Roentgenology
Pontiac		
Church, J. E.	35 W. Huron St.	Roentgenology
Pool, H. H.	35 W. Huron St.	Roentgenology
Saginaw		
Anderson, Wm. K.	316 S. Porter St.	Diagnostic roent.
St. Johns		
Ho, T. Y.		Diagnostic roent.
Traverse City		
Minor, E. B.	208½ E. Front St.	Diagnostic roent.
Ypsilanti		
Pillsbury, Chas. B.	23 N. Washington St.	Diagnostic roent.
MINNESOTA		
Duluth		
Clement, Gage	915 E. 1st St.	Radiology
McNutt, John R.	324 W. Superior St.	Roentgenology
Mankato		
Wentworth, A. J.	Main and Broad Sts.	Radiology
Minneapolis		
Allison, R. G.	78 S. 9th St.	Roentgenology *
Fleming, A. S.	900 Nicollet Ave.	Radium therapy
Harrington, Chas. D.	78 S. 9th St.	Radiology
Nordin, G. T.	825 Nicollet Ave. S.	Roentgenology *
Rigler, Leo G.	412 Delaware St. S.E.	Diagnostic roent.
Sundt, Mathias	91 S. 7th St.	Roentgenology
Ude, Walter H.	78 S. 9th St.	Roentgenology *
Rochester		
Bowing, Harry H.	Mayo Clinic	Roentgenology Radium therapy
Camp, John D.	Mayo Clinic	Diagnostic roent.
Desjardins, A. U.	Mayo Clinic	Roentgen therapy Radium therapy
Fricke, Robert E.	Mayo Clinic	Radium therapy
Kirklin, B. R.	Mayo Clinic	Diagnostic roent.
Leddy, Eugene T.	Mayo Clinic	Radium therapy
Sutherland, Charles G.	Mayo Clinic	Diagnostic roent.
Weber, Harry M.	Mayo Clinic	Diagnostic roent.
St. Cloud		
Kern, M. J.	8, 6th Ave. N.	Roentgenology *
St. Paul		
Aurelius, J. R.	350 St. Peter St.	Roentgenology *
Schons, Edward	25 W. 4th St.	Radiology
MISSISSIPPI		
Greenville		
Beals, John A.	301 Washington St.	Diagnostic roent.
Gulfport		
Van Ness, Edwin B.	2605½, 14th St.	Roentgenology
Houston		
Williams, J. Rice		Roentgenology *
Laurel		
McCormick, H. G.	531, 7th St.	Roentgenology
McComb		
Ratcliff, Marion D.	Maryland and 4th Sts.	Diagnostic roent.
Natchez		
Beekman, Marcus	307 Franklin St.	Diagnostic roent.
MISSOURI		
Holden		
Thompson, Wm. G.		Radiology
Joplin		
McGaughey, H. D.	607 Main St.	Radiology
Kansas City		
Dann, David S.	306 E. 12th St.	Roentgenology
Deweese, E. R.	906 Grand Ave.	Roentgenology
Donaldson, Clyde O.	1103 Grand Ave.	Radiology
Lockwood, Ira H.	306 E. 12th St.	Radiology
McCandless, O. H.	306 E. 12th St.	Roentgenology
McDermott, J. L.	1103 Grand Ave.	Radiology
Skinner, Edward H.	1103 Grand Ave.	Radiology
Virden, C. E.	1103 Grand Ave.	Radiology
St. Joseph		
McGlothlan, A. B.	824 Edmond St.	Roentgenology *
Ravold, Henry J.	401 N. 6th St.	Radiology
St. Louis		
Allen, Wm. E., Jr.	4202a Easton Ave.	Roentgenology
Ernst, Edwin C.	3720 Washington Ave.	Radiology
McCutchen, L. G.	3320 N. Kingshighway	Roentgenology *
Moore, Sherwood	600 S. Kingshighway	Radiology
Mueller, Wilbur K.	607 N. Grand Blvd.	Roentgenology
Peden, Joseph C.	634 N. Grand Blvd.	Roentgenology *
Sante, L. R.	634 N. Grand Blvd.	Radiology
Spinzig, Edgar W.	508 N. Grand Blvd.	Roentgenology
Titterington, P. F.	508 N. Grand Blvd.	Roentgenology
Zink, Oscar C.	5535 Delmar Blvd.	Roentgenology
Springfield		
Cole, Paul F.	200 Pershing Ave.	Radiology
MONTANA		
Billings		
Bridenbaugh, J. H.	208½ N. Broadway	Radiology
Watkins, C. F.	115 N. 28th St.	Radiology
Great Falls		
Walker, Dora	503, 1st Ave. N.	Roentgenology
NEBRASKA		
Beatrice		
Penner, H. G.	113 S. 5th St.	Roentgenology *
Rush, Weaver A.	607 W. Court St.	Radiology
Grand Island		
Woodruff, R. C.	306½ N. Locust St.	Roentgenology
Hastings		
Rork, Lee W.	131 N. Hastings Ave.	Roentgenology *
Lincoln		
Kail, Carl	4410 South St.	Roentgenology *
Rowe, Edward W.	128 N. 13th St.	Radiology
Smith, Roscoe L.	1307 N St.	Radiology
Omaha		
Fouts, Roy W.	107 S. 17th St.	Radiology
Hardy, Clyde C.	101 S. 17th St.	Roentgenology
Harris, T. T.	407 S. 16th St.	Roentgenology
Hunt, Howard B.	36th and Cuming Sts.	Radiology
Kelly, J. F.	107 S. 17th St.	Radiology
McAvin, James S.	2457 S. 16th St.	Radiology
Overgaard, A. P.	107 S. 17th St.	Roentgenology *
Ross, W. L.	407 S. 16th St.	Roentgenology
Tyler, Albert F.	103 S. 17th St.	Radiology
Scottsbluff		
Plehn, Frank W.		Roentgenology
NEVADA		
Reno		
Piersall, C. E.	120 N. Virginia St.	Radiology
NEW HAMPSHIRE		
Concord		
Eveleth, Fred S.	12 Court St.	Roentgenology
Dover		
Chesley, Harry O.	507 Central Ave.	Roentgenology
Hanover		
Sycamore, Leslie K.		Radiology
Manchester		
Merrill, A. S.	814 Elm St.	Roentgenology
Nashua		
Davis, S. G.	168 Main St.	Roentgenology
Rock, T. F.	77 Main St.	Diagnostic roent.
NEW JERSEY		
Asbury Park		
Herrman, William G.	501 Grand Ave.	Radiology
Atlantic City		
Bradley, Robert A.	1616 Pacific Ave.	Radiology
Kaighn, Charles B.	905 Pacific Ave.	Roentgenology
Bayonne		
Larkey, C. J.	700 Avenue C.	Diagnostic roent.
Beachwood		
Swan, Guy Howard		Roentgenology *
Camden		
Roberts, Joseph E.	403 Cooper St.	Roentgenology
East Orange		
May, Ernst A.	157 Harrison St.	Radiology
Reitter, George S.	144 Harrison St.	Radiology
Elizabeth		
Vogel, Herbert A.	1060 E. Jersey St.	Diagnostic roent.
Ward, Leo J.	137 W. Jersey St.	Radiology
Englewood		
Edwards, J. Bennett	350 Engle St.	Roentgenology *
Flemington		
Tompkins, G. B.		Diagnostic roent.
Hoboken		
Broeser, Henry V.	105 Newark St.	Roentgenology
Jersey City		
Maver, William W.	532 Bergen Ave.	Roentgenology *
Perlberg, Harry J.	921 Bergen Ave.	Roentgenology *
Montclair		
Schimmelpfennig, R. D.	56 Church St.	Roentgenology
Newark		
Baker, Charles F.	198 Clinton Ave.	Roentgenology *
Devlin, Frank	617 Broadway	Radiology
Furst, Nathan James	201 Lyons Ave.	Roentgenology *
Gelber, Louis J.	41 Lincoln Ave.	Roentgenology
Henle, Carye-Belle	671 Springfield Ave.	Roentgenology
Hood, Philip G.	19 Lincoln Park	Diagnostic roent.
Marquis, W. James	198 Clinton Ave.	Roentgenology
Pomeranz, Raphael	31 Lincoln Park	Roentgenology *
Reissman, Erwin	31 Lincoln Park	Radiology
Wyatt, Joseph H.	135 Clinton Ave.	Radiology

NAME	ADDRESS	TYPE OF SERVICE
New Brunswick		
Avery, Philip S.	Albany and Somerset Sts.	Radiology
Klein, Wm.	85 Bayard St.	Radiology
Passaic		
Terhune, Percy H.	171 Paulison Ave.	Diagnostic roent.
Paterson		
Golding, Harry N.	180 Carroll St.	Roentgenology
Roemer, Jacob	213 Broadway	Radiology
Perth Amboy		
Klein, Edward F.	136 Market St.	Radiology
Plainfield		
Boyes, James G.	744 Watchung Ave.	Roentgenology *
Rochelle Park		
Pallen, C. de S.		Radium therapy
Skillman		
Pigott, Albert W.		Diagnostic roent.
Succasunna		
Plume, C. A.		Diagnostic roent.
Summit		
Disbrow, G. Ward.	193 Morris Ave.	Roentgenology
Tidaback, John D.	382 Springfield Ave.	Roentgenology
Trenton		
Davison, R. Winthrop.	205 W. State St.	Radiology
West New York		
Goldstone, Karl H.	16, 18th St.	Radiology
Woodbury		
Downs, Elwood E.		Radiology

NEW MEXICO

Albuquerque		
Johns, E. W.	221 W. Central Ave.	Roentgenology
Van Atta, J. R.	219 W. Central Ave.	Radiology
Warden, M. R.	715 E. Grand Ave.	Diagnostic roent.

NEW YORK

Albany		
Cross, Warren G.	New Scotland Ave.	Roentgenology
Howard, W. P.	46 Willett St.	Roentgenology
Murnane, I. J.	New Scotland Ave.	Radiology
Prentice, D. D.	287 State St.	Radiology
Amsterdam		
Wilson, David	156 Guy Park Ave.	Roentgenology
Auburn		
Austin, Sedgwick E.	54 E. Genesee St.	Roentgenology
Bull, Harry S.	11 William St.	Diagnostic roent.
Bay Shore		
Cohoon, Carl Wm.		Roentgenology
Binghamton		
Kann, Ulysses S.	69 Walnut St.	Radiology
Shaw, Perry H.	93 Main St.	Diagnostic roent.
Brooklyn		
Bayles, William H.	1901 Bedford Ave.	Diagnostic roent.
Bell, A. L. Loomis	340 Henry St.	Radiology
Blaser, Homer S.	437 Ovington Ave.	Diagnostic roent.
Cramp, George W.	506, 6th St.	Roentgenology *
Currin, Francis W.	1136 Dean St.	Radiology
Dannenberg, Max	1464 Eastern Parkway	Roentgenology
Eastmond, Charles	483 Washington Ave.	Roentgenology *
Ehrenpreis, B.	576 Eastern Parkway	Roentgenology
Elliott, F. E.	122, 76th St.	Radiology
Forbes, Geo.	291 Hancock St.	Roentgenology
Friedmann, Asa B.	257 New York Ave.	Radiology
Gold, Louis	835 Willoughby Ave.	Diagnostic roent.
Goldfarb, Louis	608 Ocean Ave.	Diagnostic roent.
Goodman, Moses	2100, 66th St.	Radiology
Held, Louis Arthur	255 Eastern Parkway	Roentgenology *
Howes, William E.	152 Clinton St.	Roentgenology
Ingraham, Ruth	121 DeKalb Ave.	Diagnostic roent.
Kaufman, Julius	201 Eastern Parkway	Roentgenology
Levine, Isaac	1219, 49th St.	Diagnostic roent.
Liberson, F.	612 Eastern Parkway	Diagnostic roent.
Masterson, John J.	401, 76th St.	Roentgenology
Mendelson, Emanuel	132 Parkside Ave.	Roentgenology *
Nathanson, Louis	700 Ocean Ave.	Radiology
Rendich, Richard A.	116 Remsen St.	Roentgenology
Schenck, Samuel G.	115 Eastern Parkway	Radiology
Schiff, Charles H.	1000 Park Pl.	Diagnostic roent.
Segall, L. Martin	4701, 15th Ave.	Roentgenology *
Silverstein, I. S.	315 New York Ave.	Roentgenology
Strahl, Milton I.	255 New York Ave.	Diagnostic roent.
Taormina, Louis J.	1093 Gates Ave.	Roentgenology
Teperson, H. I.	744 Eastern Parkway	Radiology
Van Winkle, LeRoy P.	Kingsland and Skillman Aves.	Diagnostic roent.
Wasch, Milton G.	871 Park Pl.	Radiology
Weinstein, Samuel	1138 Eastern Pkway	Roentgenology *
Westing, Siegfried W.	180 Lenox Rd.	Diagnostic roent.
Buffalo		
Barnes, John M.	875 Lafayette Ave.	Roentgenology *
Bayliss, J. W.	472 Delaware Ave.	Roentgenology
Cotter, Stephen V.	1457 Abbott Rd.	Diagnostic roent.
DeGraff, Ralph M.	131 Linwood Ave.	Diagnostic roent.
Glan-Franceschi, J. S.	610 Niagara St.	Diagnostic roent.
Heiminiak, M. J.	929 Fillmore Ave.	Roentgenology *
Koenig, Edward C.	100 High St.	Diagnostic roent.
Lape, C. Pearley	183 Oxford Ave.	Diagnostic roent.
Levy, Sidney H.	33 Allen St.	Roentgenology
Levyn, Lester	40 North St.	Radiology
Mattick, Walter L.	290 Highland Ave.	Diagnostic roent.
Moses, Chester D.	333 Linwood Ave.	Roentgenology *
Orr, Clifford R.	1093 Ellicott St.	Radiology
Schreiner, B. F.	113 High St.	Roentgenology
Smith, B. B.	333 Linwood Ave.	Diagnostic roent.
Thompson, A. W.	135 Linwood Ave.	Roentgenology
Cooperstown		
Cruttenden, Harry L.		Radiology
McCoy, Charles C.		Roentgenology *
Cortland		
Sornberger, Frank F.	16 Church St.	Roentgenology
Elmhurst		
Startz, Irving S.	40-16 Gleane St.	Roentgenology *
Elmira		
Bennett, John A.	222 W. Church St.	Roentgenology
Endicott		
Ford, G. R.	134 Washington Ave.	Roentgenology *
Far Rockaway		
Lesoff, Morris J.	856 Central Ave.	Roentgenology *
Rivkin, Hyman	918 Cornaga Ave.	Roentgenology *
Glens Falls		
Birdsall, Edgar	140 Glen St.	Roentgenology
Gloversville		
Denham, H. C.	12 Prospect Ave.	Roentgenology
Hempstead		
Robin, Nathaniel H.	131 Fulton Ave.	Roentgenology *
Williams, P. A.	131 Fulton Ave.	Roentgenology *
Hudson		
Harris, Rosslyn P.	427 Warren St.	Diagnostic roent.
Ithaca		
Larkin, Leo P.	114 N. Tioga St.	Radiology
Mechanicsville		
Green, Geo. A.		Diagnostic roent.
Middletown		
Schmitz, Walter A.	18 Highland Ave.	Roentgenology
Walton, James W.	60 Prospect Ave.	Roentgenology
Mount Kisco		
Vaughan, F. E.		Diagnostic roent.
Newburgh		
Miller, Raymond A.	212 Grand St.	Diagnostic roent.
Reed, Charles B.	205 Liberty St.	Roentgenology
New Rochelle		
Chilko, Alexander J.	30 Disbrow Lane	Roentgenology *
Duckworth, Willard D.	421 Huguenot St.	Roentgenology *
New York City		
Abbott, Hodson A.	622 W. 168th St.	Roentgenology
Abraham, Adolph	829 Park Ave.	Radiology
Arons, Isidore	667 Madison Ave.	Roentgen therapy Radium therapy
Baum, S. M.	200 W. 58th St.	Roentgen therapy Radium therapy
Bendick, Arthur J.	2 E. 77th St.	Radiology
Bernstein, J. H.	106 E. 85th St.	Radiology
Besser, Herman	114 E. 54th St.	Roentgenology
Boone, Wm. H.	428 W. 59th St.	Roentgenology *
Bower, Jacob	133 E. 58th St.	Roentgenology
Busby, Archibald H.	133 E. 71st St.	Diagnostic roent.
Cameron, William H.	30 E. 40th St.	Radium therapy
Carty, John R.	525 E. 68th St.	Roentgenology
Cole, Lewis Gregory	36 E. 61st St.	Roentgenology *
Debbie, Anthony G.	303 E. 20th St.	Diagnostic roent.
Dieffenbach, W. H.	50 Central Park West	Radiology
Dixon, Geo. S.	1150, 5th Ave.	Diagnostic roent.
Duffy, James J.	424 Park Ave.	Roentgen therapy Radium therapy
Ehrlich, David Ernest	27 W. 86th St.	Radiology
Fairchild, C. W.	11 E. 48th St.	Diagnostic roent.
Ferguson, A. B.	420 E. 59th St.	Roentgenology
Fierstein, Jacob	1018 E. 163d St.	Roentgenology *
Fineman, Solomon	133 E. 58th St.	Diagnostic roent.
Fox, Elsie	384 E. 149th St.	Roentgenology
Francis, William J.	121 Madison Ave.	Roentgenology
Freid, Jacob R.	1049 Park Ave.	Radiology
Fried, Herman	333 West End Ave.	Roentgenology *
Friedland, Henry	2021 Grand Concourse	Diagnostic roent.
Friedman, Lewis J.	315 E. 18th St.	Roentgenology
Friedman Max	1940 Grand Concourse	Diagnostic roent.
Friedman, Milton	309 W. 103d St.	Roentgen therapy Radium therapy
Friedmann, Joseph	53 W. 73d St.	Radiology
Froehlich, Eugene	28 W. 74th St.	Roentgenology
Glassman, I.	138 E. 36th St.	Diagnostic roent.
Goldberg, N. J.	460 E. 138th St.	Diagnostic roent.
Golden, Ross	622 W. 168th St.	Roentgenology
Gottlieb, Charles	210 W. 79th St.	Roentgenology
Groeschel, L. B.	911 Park Ave.	Radiology
Harris, Wm.	70 E. 77th St.	Roentgen therapy Radium therapy
Herendeen, Ralph E.	30 E. 40th St.	Roentgenology *
Hirsch, Henry	2488 Grand Concourse	Radiology
Hirsch, I. Seth	136 E. 64th St.	Radiology
Horvath, Rudolph J.	1085 Park Ave.	Diagnostic roent.
Howard, J. Campbell	40 E. 61st St.	Roentgenology *
Huber, Frank	30 E. 40th St.	Roentgenology *
Illick, H. Earl	111 E. 76th St.	Roentgenology
Imboden, Harry M.	30 W. 59th St.	Radiology
Jaches, Leopold	100 E. 94th St.	Radiology
Jacobs, Alexander W.	40 W. 72d St.	Roentgen therapy Radium therapy
Johnson, Redford K.	30 E. 40th St.	Diagnostic roent.
Kaplan, Ira I.	55 E. 86th St.	Roentgen therapy Radium therapy
Kaplan, Morris	130 Henry St.	Diagnostic roent.
Kasabach, Haig H.	622 W. 168th St.	Radiology
Kassow, Israel O.	1840 Grand Concourse	Diagnostic roent.
Kean, Albert	100 E. 94th St.	Radiology
Klein, Isadore	100 Central Park South	Radiology
Kraft, Ernest	33 E. 64th St.	Roentgenology *
Kurz, Bernard	1235 Grand Concourse	Diagnostic roent.
Landsman, I. J.	80 William St.	Diagnostic roent.
Lapman, Charles	2754 Grand Concourse	Diagnostic roent.

NAME	ADDRESS	TYPE OF SERVICE
Law, Frederick M.	140 E. 54th St.	Diagnostic roent.
Lefrak, Louis	144 E. 36th St.	Diagnostic roent.
Lenz, Maurice	180 Ft. Washington Ave.	Roentgen therapy Radium therapy
Levin, Isaac	57 W. 57th St.	Radiology
Lewis, Raymond W.	115 E. 61st St.	Diagnostic roent.
Massaro, Alfonso F.	227 E. 19th St.	Diagnostic roent.
Merrill, E. Forrest	30 W. 59th St.	Roentgenology *
Meyer, William Henry	303 E. 20th St.	Roentgenology *
Ossip, Abraham	152 Henry St.	Diagnostic roent.
Ourian, Adom K.	175 Lexington Ave.	Roentgenology
Phillips, Herman B.	9 W. 68th St.	Radiology
Pomeranz, Maurice M.	911 Park Ave.	Radiology
Posner, Herman Paul	467 E. 138th St.	Diagnostic roent.
Powell, C. B.	2368, 7th Ave.	Diagnostic roent.
Quimby, A. Judson	5 E. 57th St.	Roentgenology
Radding, Moses B.	24 W. 74th St.	Roentgenology *
Remer, John	200 W. 59th St.	Roentgenology *
Richman, Samuel	1049 Park Ave.	Radiology
Robinson, G. Allen	40 E. 61st St.	Radium therapy
Robinson, William T.	322 W. 72d St.	Roentgenology
Ryan, E. J.	421 W. 113th St.	Roentgenology
Schechter, Samuel	315 W. 86th St.	Diagnostic roent.
Scholz, Thomas	38 E. 85th St.	Diagnostic roent.
Schroeder, Max J.	319 E. 6th St.	Diagnostic roent.
Schwartz, C. W.	33 E. 68th St.	Roentgenlogy
Schwartz, Irving	1150, 5th Ave.	Diagnostic roent.
Sinberg, Samuel E.	114 E. 54th St.	Roentgenology
Sittenfield, M. J.	29 W. 74th St.	Roentgen therapy Radium therapy
Snow, Wm.	941 Park Ave.	Roentgenology
Spillman, Ramsay	115 E. 61st St.	Diagnostic roent.
Steiner, Joseph M.	170 East End Ave.	Roentgenology *
Stevens, J. Thompson	745, 5th Ave.	Roentgen therapy Radium therapy
Stewart, Wm. H.	111 E. 76th St.	Roentgenology
Sussman, Marcy L.	166 E. 96th St.	Diagnostic roent.
Swenson, Paul C.	622 W. 168th St.	Diagnostic roent.
Taylor, Henry K.	667 Madison Ave.	Diagnostic roent.
Unger, Arthur S.	135 E. 74th St.	Roentgenology
Weinberg, Tobias B.	310 E. 15th St.	Roentgenology
Weiss, Leopold D.	36 W. 59th St.	Roentgenology
Weltzner, Imre	1015 Lexington Ave.	Radiology
Weltzner, Samuel F.	1882 Grand Concourse	Radiology
White, Stephen	57 W. 57th St.	Roentgenology
Wood, Francis C.	1145 Amsterdam Ave.	Roentgen therapy Radium therapy
Niagara Falls		
Scott, Walter Roger	598 Pine Ave.	Radiology
Ossining		
Wyser, Dorean D.	304 Spring St.	Roentgenology
Oswego		
Wallace, H. M.	140 W. 5th St.	Roentgenology
Peekskill		
Snowden, Fred A.	108 Depew St.	Roentgenology
Port Chester		
West, Theodore	Boston Post Rd.	Radiology
Poughkeepsie		
Davison, Chester O.	Lincoln Ave. and Reade Pl.	Radiology
Richmond Hill		
Voltz, Albert L.	11520 Myrtle Ave.	Radiology
Rochester		
Almy, Max A.	16 N. Goodman St.	Roentgenology
Davidson, Sol C.	277 Alexander St.	Radiology
Flynn, James M.	277 Alexander St.	Radiology
Fray, Walter W.	260 Crittenden Blvd.	Roentgenology *
Green, Joseph H.	277 Alexander St.	Roentgenology
Lingeman, Leslie R.	501 W. Main St.	Roentgenology *
Sanders, L. J.	213 Alexander St.	Roentgenology
Thomas, Camp C.	476 Lake Ave.	Roentgenology
Warren, Stafford L.	260 Crittenden Blvd.	Radiology
Saratoga Springs		
King, Earl H.	75 Caroline St.	Roentgenology
Schenectady		
Crouch, A. N.	Nott St. and Rosa Rd.	Diagnostic roent.
Syracuse		
Caliva, Salvatore	510 Prospect Ave.	Diagnostic roent.
Childs, Donald S.	713 E. Genesee St.	Roentgenology *
Hadley, Lee A.	713 E. Genesee St.	Roentgenology
Henry, Lucas S.	116 E. Castle St.	Roentgenology
Lavine, Reuben	601 S. Warren St.	Roentgenology
Potter, Carlton F.	425 Waverly Ave.	Roentgenology
Rulison, Foster C.	713 E. Genesee St.	Roentgenology
Utica		
Hall, Robert C.	258 Genesee St.	Roentgenology
Powers, M. T.	250 Genesee St.	Roentgenology
Valhalla		
Morris, William E.		Roentgenology *
Watertown		
Pawling, Jesse R.	100 Stone St.	Roentgenology Radium therapy
Sickels, T. N.	120 Stone St.	Radiology
White Plains		
Duckworth, R. D.	170 Maple Ave.	Roentgenology
Sherman, Herbert	99 Church St.	Roentgenology
Woodhaven		
Knapp, John C.	8525, 86th St.	Radiology

NORTH CAROLINA

Asheville		
MacRae, J. Donald	346 Montford Ave.	Radiology
Murphy, G. W.	30 Battery Park Ave.	Roentgenology *
Charlotte		
Lafferty, Robert H.	127 W. 7th St.	Radiology
Phillips, Clyde C.	127 W. 7th St.	Radiology
Durham		
Reeves, R. J.	Duke Hospital	Radiology
Smith, Wm. L.	Watts Hospital	Radiology
Goldsboro		
Ivey, H. B.	139 W. Walnut St.	Roentgenology Radium therapy
Greensboro		
Rhudy, Booker E.	101 N. Elm St.	Roentgenology
Shohan, Joseph	122 S. Green St.	Roentgenology *
Raleigh		
Noble, Robert P.	127 W. Hargett St.	Roentgenology *
Rocky Mount		
Fleming, Major I.	404 Falls Road	Roentgenology
Spencer		
Sigman, F. G.		Roentgenology *
Statesville		
McElwee, R. S.	153 Broad St.	Roentgenology
Washington		
Kluttz, DeWitt		Roentgenology
Winston-Salem		
Rousseau, J. P.	310 W. 4th St.	Radiology

NORTH DAKOTA

Bismarck		
Berg, H. Milton	221, 5th St.	Roentgenology *
Fargo		
Rothnem, Thos. Peter	807 Broadway	Roentgenology
Minot		
Hansen, Cyrus O.	20, 4th Ave. S.W.	Radiology

OHIO

Akron		
Selby, John Hunter	159 S. Main St.	Roentgenology
Stall, A. H.	525 E. Market St.	Radiology
Stewart, J. E.	159 S. Main St.	Roentgenology
Voke, Edward L.	256 W. Cedar St.	Roentgenology
Ashtabula		
Collander, P. J.	217 Park Pl.	Roentgenology
Canton		
Hendrickson, Anna R.	115 Dewalt Ave. N.W.	Roentgenology *
Peters, Chester M.	300 McKinley Ave. N.W.	Radiology
Shorb, John E.	411, 3d St. N.W.	Roentgenology *
Chillicothe		
Holmes, Ralph W.	Cherry and Chestnut Sts.	Roentgenology
Cincinnati		
Bader, E. R.	441 Vine St.	Radiology
Brodberger, Wm. L.	2301 E. Hill Ave.	Roentgenology
Brown, Samuel	707 Race St.	Roentgenology *
Dillard, Charles E.	514 Clark St.	Roentgenology
Doughty, Wm. M.	441 Vine St.	Radiology
Goosmann, Charles	22 W. 7th St.	Radiology
Koehler, C. W.	19 Garfield Place	Radiology
Lange, Sidney	19 Garfield Place	Radiology
McCarthy, Justin E.	707 Race St.	Roentgenology
Reineke, Harold G.	Burnet Ave. and Goodman St.	Roentgenology *
Warne, B. M.	19 Garfield Place	Roentgenology
Cleveland		
Bettelheim, Frederick	1021 Prospect Ave.	Radiology
Farmer, H. L.	10515 Carnegie Ave.	Radiology
Freedman, Edward F.	2060 E. 9th St.	Roentgenology
Freedman, Eugene	2065 Adelbert Rd.	Roentgenology *
Hauser, Harry	3395 Scranton Rd.	Radiology
Hill, Walter C.	10515 Carnegie Ave.	Radiology
LeFevre, Walter I.	9400 Euclid Ave.	Roentgenology
Mahrer, H. A.	10515 Carnegie Ave.	Roentgenology *
May, Raymond V.	10515 Carnegie Ave.	Radiology
May, Robert J.	10515 Carnegie Ave.	Radiology
McNamee, Edgar P.	1422 Euclid Ave.	Diagnostic roent.
Nichols, B. H.	2020 E. 93d St.	Radiology
Osmond, John D.	10515 Carnegie Ave.	Radiology
Portmann, U. V.	2020 E. 93d St.	Roentgen therapy Radium therapy
Steel, David	7911 Detroit Ave.	Roentgenology
Thomas, M. A.	10515 Carnegie Ave.	Radiology
West, James H.	10515 Carnegie Ave.	Radiology
Yoelson, I. E.	2060 E. 9th St.	Roentgenology
Columbus		
Bowen, Chas. F.	332 E. State St.	Radiology
Fulton, Huston F.	327 E. State St.	Roentgenology *
Harris, Herman L.	273 State St.	Roentgenology
Kirkendall, Ben R.	137 E. State St.	Roentgen therapy Radium therapy
Means, Hugh J.	683 E. Broad St.	Radiology
Miller, W. H.	328 E. State St.	Radiology
Reinert, Edward	247 E. State St.	Radiology
Riebel, Frank A.	15 W. Goodale St.	Radiology
Sims, Geo. P.	188 E. State St.	Radiology
Weirauk, H. V.	9 Buttles Ave.	Roentgenology
Dayton		
Burnett, Harry W.	209 S. Main St.	Radiology
Delscamp, W. H.	209 S. Main St.	Roentgenology
Jones, Lynn M.	117 S. Main St.	Roentgenology *
Price, Rudolph J.	209 S. Main St.	Radiology
Fremont		
Philo, D. W.	209 W. State St.	Roentgenology
Gallipolis		
Wilson, Milo		Radiology
Hamilton		
Benzing, George, Jr.	R. D. 3	Radiology
Lakewood		
McDowell, John R.	15701 Detroit Ave.	Roentgenology
Shetter, North W.	14600 Detroit Ave.	Roentgenology

NAME	ADDRESS	TYPE OF SERVICE
Lima		
Thomas, Herbert A.	131 N. Elizabeth St.	Radiology
Martins Ferry		
Krupp, David D.	83 N. 3d St.	Roentgenology
Massillon		
Holston, J. D.	876 Amherst Rd. N.E.	Diagnostic roent.
Piqua		
Spencer, Robert D.	400 N. Main St.	Roentgenology
Salem		
Heck, Stanton	1160 E. State St.	Roentgenology
Sandusky		
Hill, Lyle S.	526 Columbus Ave.	Roentgenology
Springfield		
Brubaker, E. R.	8 W. Main St.	Radiology
Ultes, Will	E. High St. and Burnett Rd.	Roentgenology *
Steubenville		
Miller, J. E.	401 Market St.	Radiology
Toledo		
Goodrich, Murray E.	2001 Collingwood Ave.	Roentgenology *
Kahn, Dalton	237 Michigan St.	Roentgenology
Murphy, John T.	421 Michigan St.	Radiology
Warren		
Gauchat, Paul C.	197 W. Market St.	Roentgenology
Simpson, D. G.	775 Mahoning Ave. N.W.	Roentgenology
Wauseon		
Maddox, Wm. H.		Roentgenology
Youngstown		
Bachman, M. H.	314 N. Phelps St.	Roentgenology *
Baker, Edgar C.	Youngstown Hospital	Radiology
Heberding, John	151 W. Rayen Ave.	Roentgenology
Heeley, J. A.	275 W. Federal St.	Roentgenology
Meyer, N. N.	26 Market St.	Diagnostic roent.
Tamarkin, Saul J.	1026 Belmont Ave.	Roentgenology *
Zanesville		
Holston, J. G. F.	620 South St.	Roentgenology
Loebell, Maurice A.	114 N. 6th St.	Roentgenology *

OKLAHOMA

Marlow		
Talley, C. N.		Diagnostic roent.
Oklahoma City		
Heatley, John E.	119 N. Broadway	Diagnostic roent.
Myers, Ralph Emerson	1200 N. Walker St.	Radiology
Okmulgee		
Ming, Charles M.	220 S. Morton Ave.	Roentgenology
Shawnee		
Hughes, J. E.	14 E. 9th St.	Diagnostic roent. Radium therapy
Sulphur		
Annadown, P. V.		Diagnostic roent.
Tulsa		
Larrabee, W. S.	108 W. 6th St.	Roentgenology
Lhevine, Morris B.	108 W. 6th St.	Diagnostic roent.
Stuart, Leon H.	108 W. 6th St.	Roentgenology

OREGON

Eugene		
Barnett, Arthur F.	132 E. Broadway	Roentgenology
Medford		
Moffatt, F. J.	35 N. Central Ave.	Roentgenology
Portland		
Butler, Frank E.	1020 S. W. Taylor St.	Roentgenology
Haworth, Wallace	833 S. W. 11th St.	Roentgenology
Palmer, Dorwin L.	1130 S. W. Morrison St.	Radiology
Rees, Sherman E.	2447 N. W. Westover Rd.	Roentgenology *
Wight, Otis B.	833 S. W. 11th Ave.	Radium therapy
Woolley, Ivan M.	1020 S. W. Taylor St.	Roentgenology *

PENNSYLVANIA

Allentown		
Smyth, Thos. L.	111 N. 8th St.	Radiology
Troxell, Wm. C.	941 Hamilton St.	Radiology
Altoona		
Alleman, George E.	1121, 13th Ave.	Roentgenology
Bliss, Gerald D.	1220, 13th Ave.	Radiology
Ashland		
Mulligan, P. B.		Roentgenology
Bethlehem		
Leibert, H. F.	R. D. 4	Roentgenology
Bryn Mawr		
Bromer, Ralph S.		Roentgenology
Chester		
Egbert, Walter E.	601 E. 13th St.	Roentgenology *
Sharpe, A. Maxwell	708 Sproul St.	Roentgenology *
Clearfield		
Reiley, W. E.		Radiology
Coatesville		
Perkins, J. A.	367 Chestnut St.	Diagnostic roent.
Conshohocken		
Burvill-Holmes, E.		Diagnostic roent.
Danville		
Hawley, S. J.		Roentgenology *
DuBois		
Gann, G. W.	49 E. Long Ave.	Roentgenology
McCormick, A. F.	Maple Avenue	Roentgenology
Easton		
Quiney, James J.	309 Bushkill St.	Radiology
Erie		
Putts, B. Swayne	117 W. 8th St.	Radiology
Greensburg		
McMurray, H. A.	107 S. Main St.	Roentgenology
Hanover		
Bortner, C. E.	123 York St.	Diagnostic roent.
Harrisburg		
Ritzman, A. Z.	234 State St.	Roentgenology *
Hatboro		
Shoemaker, Robt., III		Roentgenology
Hazleton		
Dessen, Louis A.	4 W. Broad St.	Roentgenology
Huntingdon		
Kelchline, John M.		Radiology
Johnstown		
Scharmann, Frank G.	218 Franklin St.	Diagnostic roent.
Stewart, H. M.	218 Franklin St.	Radiology
Lancaster		
Davis, Henry B.	530 N. Lime St.	Roentgenology Radium therapy
Snoke, Paul O.	129 College Ave.	Radiology
Swab, Robert D.	23 E. Walnut St.	Roentgenology
Lebanon		
Boger, John D.	341 Cumberland St.	Diagnostic roent.
Lewistown		
Weaver, O. M.	12 S. Main St.	Roentgenology
Lock Haven		
Green, Geo. D.		Roentgenology
Mahanoy City		
Kapo, Peter J.	211 W. Center St.	Radiology
McKeesport		
Snedden, A. R.	522 Walnut St.	Roentgenology
Meadville		
Gingold, Joseph R.	470-4 Pine St.	Roentgenology
New Castle		
Cooper, J. R.	111 E. North St.	Radiology
New Kensington		
Brown, Prentiss A.	901, 5th Ave.	Roentgenology
Norristown		
Campbell, Raymond F.	514 Swede St.	Diagnostic roent.
Perkasie		
Strouse, O. H.		Roentgenology
Philadelphia		
Alexander, F. K.	8835 Germantown Ave.	Radiology
Barker, Walter C.	37 S. 20th St.	Radiology
Bertin, Elmer J.	54th St. and Cedar Ave.	Roentgenology
Bird, G. C.	1415 W. Erie Ave.	Roentgenology
Bishop, Paul A.	8th and Spruce Sts.	Radiology
Borzell, Francis F.	4940 Penn St.	Roentgenology
Bowen, David R.	8th and Spruce Sts.	Radiology
Bruck, Samuel	2104 Pine St.	Roentgenology
Carpenter, Samuel A.	2265 N. 16th St.	Roentgenology
Chamberlain, W. E.	3401 N. Broad St.	Radiology
Edelken, Louis	1832 Spruce St.	Radiology
Evans, Harry D.	1120 N. 63d St.	Roentgenology *
Farrell, John T., Jr.	235 S. 15th St.	Roentgenology *
Feldstein, Sidney L.	1829 Pine St.	Roentgenology
Frank, Jacob W.	1730 Spruce St.	Roentgenology *
Gershon-Cohen, J.	255 S. 17th St.	Roentgenology
Henry, Robert W.	768 S. 15th St.	Roentgenology
Hutton, Frederick C.	1409 N. 15th St.	Roentgenology *
Koenig, Carl F.	1734 Harrison St.	Roentgenology
Kornblum, Karl	1818 Lombard St.	Radiology
Manges, Willis F.	235 S. 15th St.	Roentgenology *
Merchant, Albert K.	3401 N. Broad St.	Roentgenology *
Newcomet, W. S.	3501 Baring St.	Radiology
O'Boyle, Cyril P.	4930 Walnut St.	Roentgenology *
Ostrum, H. W.	1729 Pine St.	Radiology
Pancoast, Henry K.	3400 Spruce St.	Radiology
Pendergrass, Eugene P.	3400 Spruce St.	Radiology
Percival, M. F.	Broad and Wolf Sts.	Radiology
Pfahler, George E.	1930 Chestnut St.	Radiology
Post, Joseph W.	1930 Chestnut St.	Roentgenology
Rieger, Chas. L. W.	1304 Rockland St.	Roentgenology *
Rosenbaum, George	1521 Spruce St.	Radiology
Schmidt, Wm. Henry	1601 Walnut St.	Radiology
Sender, Arthur C.	1311 W. Allegheny Ave.	Roentgenology
Solis-Cohen, Leon	2110 Spruce St.	Roentgenology
Spackman, E. W.	1824 Chestnut St.	Radiology
Stecher, Wm. R.	1000 S. 60th St.	Radiology
Stull, H. Tuttle	3260 N. Broad St.	Roentgenology
Sturr, Robert P.	269 S. 19th St.	Roentgenology Radium therapy
Vastine, Jacob H.	1930 Chestnut St.	Radiology
Widmann, B. P.	250 S. 18th St.	Radiology
Wiley, Louis R.	1512 N. 15th St.	Roentgenology
Zulick, J. Donald	2008 Walnut St.	Roentgenology
Philipsburg		
Benson, Andrew L.		Roentgenology
Pittsburgh		
Alley, Reuben G.	4800 Friendship Ave.	Diagnostic roent.
Caldwell, C. S.	520 S. Aiken Ave.	Diagnostic roent.
Fisher, J. W.	500 Penn Ave.	Radiology
Goldsmith, Maurice F.	3459, 5th Ave.	Roentgenology *
Gorfinkell, Julius	3401, 5th Ave.	Roentgenology
Grier, G. W.	500 Penn Ave.	Radiology
Grimm, Homer W.	500 Penn Ave.	Radiology
Jacox, Harold Wm.	1400 Friendship Ave.	Radiology
Johnston, Zoe A.	500 Penn Ave.	Roentgenology
McCullough, John F.	500 Penn Ave.	Radiology
McCullough, Thos. L.	121 University Pl.	Roentgenology
Ray, William B.	110 E. Stockton Ave.	Roentgenology *

NAME	ADDRESS	TYPE OF SERVICE
Schaefer, Charles N.	500 Penn Ave.	Radiology
Schumacher, F. L.	500 Penn Ave.	Roentgenology
Sterrett, William J.	110 Stockton Ave.	Roentgenology *
Reading		
Meter, Edward G.	230 N. 5th St.	Roentgenology *
Travis, Richard C.	230 N. 5th St.	Roentgenology Radium therapy
Rochester		
McCaskey, F. H.		Roentgenology
Scranton		
Corcoran, Wm. J.	1536 N. Washington Ave.	Roentgenology
Jackson, Byron H.	327 N. Washington Ave.	Radiology
Milkman, Louis A.	327 N. Washington Ave.	Roentgenology *
von Poswik, Gisela	217 Jefferson Ave.	Roentgenology
Shippensburg		
Stewart, Alexander		Roentgenology
Tamaqua		
Hinkel, William H.	243 E. Broad St.	Roentgenology
Trucksville		
Howell, G. L.		Roentgenology
Uniontown		
Hess, George H.	104 Morgantown St.	Roentgenology
Upper Darby		
Clagett, A. H.	Long Lane and Brent Rd.	Roentgenology
West Chester		
Pennell, Howard Y.	Boot Rd.	Roentgenology
Wilkes-Barre		
DesJardins, A.	N. River and Auburn Sts.	Roentgenology *
Rogers, Lewis L.	38 N. Franklin St.	Roentgenology
Wilkinsburg		
McAdams, Edward C.	9040 Frankstown Rd.	Roentgenology
McGregor, William J.	312 Penn Ave.	Roentgenology
Williamsport		
Wurster, L. E.	416 Pine St.	Roentgenology
York		
Bennett, John H.	1253 W. Market St.	Radiology
Landes, L. S.	454 W. Market St.	Diagnostic roent.
Lutz, J. Fletcher	141 E. Market St.	Roentgenology

RHODE ISLAND

Providence		
Albert, Simon	126 Waterman St.	Roentgenology *
Batchelder, Philip	188 Waterman St.	Roentgenology
Benjamin, Emanuel W.	105 Waterman St.	Radiology
Boyd, James F.	195 Angell St.	Radiology
Gerber, Isaac	126 Waterman St.	Radiology
Kelley, Jacob S.	153 Smith St.	Diagnostic roent.
McNally, D. Raymond.	541 Hope St.	Roentgenology
West Warwick		
Farrell, John T.	Brookfield Hills	Diagnostic roent.
Woonsocket		
Garrison, Norman S.	38 Hamlet Ave.	Radiology

SOUTH CAROLINA

Anderson		
Wrenn, Frank	620 N. Fant St.	Radiology
Charleston		
Rudisill, Hillyer, Jr.	Lucas and Calhoun Sts.	Radiology
Taft, Robert B.	105 Rutledge Ave.	Radiology
Columbia		
Pitts, Thomas A.	1515 Marion St.	Radiology
Rodgers, Floyd D.	1417 Hampton St.	Radiology
Florence		
Hay, Percy D., Jr.	101 W. Cheves St.	Radiology
Greenville		
Judy, W. S.	107 E. North St.	Radiology
Spartanburg		
Sheridan, William M.	120 W. Main St.	Radiology
Walker, Howard M.	120 W. Main St.	Radiology

SOUTH DAKOTA

Pierre		
McLaurin, A. A.		Roentgenology
Sioux Falls		
Nessa, Nelius J.	303 S. Minnesota Ave.	Roentgenology
Watertown		
Koren, F.	3½ E. Kemp Ave.	Roentgenology *

TENNESSEE

Chattanooga		
Bogart, F. B.	546 McCallie Ave.	Roentgenology
Frere, John Marsh	707 Walnut St.	Roentgenology *
Marchbanks, S. S.	546 McCallie Ave.	Radiology
Johnson City		
Hankins, John L.	300 Boone St.	Roentgenology
Knoxville		
Abercrombie, Eugene	603 W. Main Ave.	Roentgenology
McCampbell, H. H.	614 Walnut St.	Radiology
Reaves, Hugh G.	422 W. Cumberland Ave.	Roentgenology *
Memphis		
Bethea, W. R.	899 Madison Ave.	Roentgenology *
Coley, Steve W.	1265 Union Ave.	Roentgenology *
Heacock, Charles H.	20 S. Dunlap St.	Radiology
Herring, J. H.	915 Madison Ave.	Roentgenology
King, J. Cash	860 Madison Ave.	Roentgenology
Lawrence, W. S.	248 Madison Ave.	Radiology
Robinson, W. W.	1291 Union Ave.	Roentgenology
Murfreesboro		
Overall, J. Clyde		Roentgenology
Nashville		
McClure, C. C.	706 Church St.	Radiology
Shoulders, H. S.	706 Church St.	Roentgenology

TEXAS

Amarillo		
Van Sweringen, Walter	301 Polk St.	Roentgenology
Vaughan, John H.	724 Polk St.	Radiology
Beaumont		
Barr, Richard E.	390 Pearl St.	Radiology
Ledbetter, L. H.	390 Pearl St.	Radiology
White, C. M.	595 Orleans St.	Roentgenology
Corpus Christi		
Crain, Carroll F.	416 Chaparral St.	Radiology
Corsicana		
Curtis, Richard C.	409 W. 6th Ave.	Roentgenology
Dallas		
Beaver, N. B.	1719 Pacific Ave.	Radiology
Martin, Charles L.	3500 Junius St.	Radiology
Martin, J. M.	3500 Junius St.	Radiology
Spangler, Davis	4105 Live Oak St.	Radiology
Eastland		
Caton, J. H.		Roentgenology
El Paso		
Cathcart, J. W.	116 Mills St.	Radiology
Mason, C. H.	116 Mills St.	Radiology
York, M. N.	2319 Federal St.	Roentgenology
Fort Worth		
Bond, Tom B.	602 W. 10th St.	Radiology
Hyde, X. R.	602 W. 10th St.	Radiology
Jagoda, S.	1212 W. Lancaster St.	Radiology
O'Bannon, R. P.	1028, 5th Ave.	Radiology
Galveston		
Johnson, Jesse B.	2201 Avenue D.	Radiology
Houston		
Durrance, Fred Y.	1215 Walker Ave.	Roentgenology
Harris, C. P.	1625 Main St.	Roentgenology *
McDeed, W. G.	1215 Walker Ave.	Roentgenology *
McHenry, R. K.	1215 Walker Ave.	Roentgenology
Mineral Wells		
Yeager, Robt. L.		Roentgenology
San Angelo		
Smith, Jerome H.	E. Harris and S. Magdalen Sts.	Roentgenology Radium therapy
San Antonio		
Barron, Wm. Marshall	705 E. Houston St.	Roentgenology *
Hamilton, W. S.	705 E. Houston St.	Diagnostic roent.
Ostendorf, W. A.	106 Broadway	Roentgenology
Sherman		
Henschen, G. E.	500 N. Highland Ave.	Roentgenology *
Temple		
Giles, Roy G.	213 W. Ave. G.	Roentgenology *
Powell, Eugene V.	304 S. 22d St.	Radiology
Wilson, R. T.	213 W. Ave. G.	Roentgenology *
Waco		
Jenkins, I. Warner	425 Austin Ave.	Radiology
Wichita Falls		
Wilcox, Clark A.	1300, 8th St.	Roentgenology *

UTAH

Salt Lake City		
Coray, Q. B.	50 E. South Temple St.	Roentgenology
Kerby, James P.	11 Exchange Pl.	Roentgenology *

VERMONT

Burlington		
Caldwell, Nathan R.	266 Main St.	Roentgenology *
Robinson, Carl F.	266 Main St.	Roentgenology
Rutland		
Cook, Benjamin F.	46 Nichols St.	Diagnostic roent.

VIRGINIA

Harrisonburg		
Canter, Noland M.		Roentgenology
Lynchburg		
Spencer, Hunter B.	725 Church St.	Radiology
Newport News		
Davis, R. A.	256 Blair Ave.	Roentgenology
Norfolk		
Eley, Clayton W.	Wood and Church Sts.	Roentgenology *
Hunter, James W., Jr.	144 W. York St.	Radiology
Petersburg		
Barker, W. Allen	34 Franklin St.	Radiology
Clarkson, Wright	34 Franklin St.	Radiology
Richmond		
Flanagan, E. Latane	116 E. Franklin St.	Roentgenology
Hodges, Fred M.	1000 W. Franklin St.	Radiology
Mandeville, Frederick B.	1201 E. Broad St.	Roentgenology *
Snead, Lawrence O.	1000 W. Franklin St.	Radiology
Tabb, J. Lloyd	116 E. Franklin St.	Roentgenology *
Talley, Daniel D., Jr.	501 E. Franklin St.	Roentgenology *
Whitehead, L. J.	501 E. Franklin St.	Roentgenology *
Roanoke		
Armentrout, John F.	30½ Franklin Rd. S. W.	Radiology
McKinney, Joseph T.	30½ Franklin Rd. S. W.	Roentgenology *
Peterson, C. H.	30½ Franklin Rd. S. W.	Roentgenology *
University		
Archer, Vincent W.		Roentgenology *

WASHINGTON

NAME	ADDRESS	TYPE OF SERVICE
Bellingham		
Cilley, Earl T. L.	1155 State St.	Radiology
Hoquiam		
McCarty, E. D.	606 K St.	Roentgenology
Longview		
Hayes, Richard	15th Ave. and Douglas St.	Roentgenology
Seattle		
Dwyer, Maurice F.	1115 Terry Ave.	Radiology
Exner, Fredk. B.	509 Olive Way	Radiology
Garhart, Manch N.	1305, 4th Ave.	Radiology
Holtz, Kenneth J.	920, 2d Ave.	Roentgenology
Koenig, Carl E.	509 Olive St.	Roentgenology
Nichols, H. E.	1215, 4th Ave.	Roentgenology
Snively, J. Howard	1120, 21st Ave. N.	Roentgenology *
Stephens, Lorenzo L.	1215, 4th Ave.	Radiology
Thompson, H. B.	1305, 4th Ave.	Radiology
Thomson, Curtis H.	1305, 4th Ave.	Roentgenology *
Ward, Chas. B.	1305, 4th Ave.	Radiology
Spokane		
Aspray, Joseph	407 Riverside Ave.	Radiology
Betts, Arthur	407 Riverside Ave.	Radiology
Tacoma		
Fishel, C. R.	740 St. Helens Ave.	Roentgenology
Walla Walla		
Johannesson, C. J.	8 S. 2d Ave.	Roentgenology *
Yakima		
Cornett, Geo. W.	102 S. Naches St.	Roentgenology *

WEST VIRGINIA

NAME	ADDRESS	TYPE OF SERVICE
Fairmont		
Francis, Charles T.	200 Gaston Ave.	Roentgenology
Hollidays-Cove		
Davis, Geo. H.		Diagnostic roent.
Huntington		
MacKenzie, A. R.	955, 4th Ave.	Roentgenology *
Parkersburg		
Boice, Ralph Homer	717 Ann St.	Roentgenology
Rose, Lonzo O.	807 Murdock Ave.	Radiology
Wheeling		
Bippus, E. S.	77, 16th St.	Roentgenology
Clovis, C. H.	2000 Eoff St.	Radiology
Haislip, Norvell L.	40, 14th St.	Radiology
Kalbfleisch, W. K.	58, 16th St.	Roentgenology
Quimby, Will A.	1401 Market St.	Radiology

WISCONSIN

NAME	ADDRESS	TYPE OF SERVICE
Appleton		
McGrath, E. F.	114 W. College Ave.	Radiology
Beloit		
Wilson, Russell F.	431 Olympian Blvd.	Radiology
Eau Claire		
Baird, J. C.	401 S. Barstow St.	Roentgenology
Green Bay		
Olmsted, Austin O.	207 E. Walnut St.	Radiology
Shewalter, G. M.	305 E. Walnut St.	Roentgenology
Troup, R. L.	306 Cherry St.	Roentgenology
Janesville		
Kuegle, F. H.	19 S. Main St.	Roentgenology
Kenosha		
Bowing, Irwin E.	625, 57th St.	Roentgenology
Sokow, Theodore	723, 58th St.	Radiology
LaCrosse		
McLoone, J. E.	319 Main St.	Roentgenology
Madison		
Ellis, Ivan G.	720 S. Brooks St.	Roentgenology
Littig, Lawrence V.	925 Mound St.	Roentgenology
Pohle, E. A.	1300 University Ave.	Radiology
Sisk, J. Newton	16 S. Henry St.	Roentgenology Radium therapy
Marshfield		
Potter, R. P.		Roentgenology
Milwaukee		
Altenhofen, A. R.	152 W. Wisconsin Ave.	Roentgenology
Dorr, A. M.	161 W. Wisconsin Ave.	Roentgenology *
Epperson, Paul S.	324 E. Wisconsin Ave.	Roentgenology
Habbe, John Edwin	231 W. Wisconsin Ave.	Roentgenology
Mackoy, F. W.	1545 S. Layton Blvd.	Diagnostic roent.
Morton, S. A.	3321 N. Maryland Ave.	Roentgenology
Zmyslony, W. P.	931 W. Mitchell St.	Diagnostic roent.
Neenah		
Greenwood, S. D.		Radiology
Salem		
Fletcher, Wm.		Roentgenology
Waukesha		
Peterson, Geo. E.	821 N. Grand Ave.	Roentgenology

WYOMING

NAME	ADDRESS	TYPE OF SERVICE
Cheyenne		
Conyers, Chester A.	1720 Carey Ave.	Radiology

PHYSICIANS SPECIALIZING IN RADIOLOGY IN GOVERNMENT SERVICE

UNITED STATES ARMY

NAME	ADDRESS	TYPE OF SERVICE
Bowen, Albert, Maj.	Station Hosp., San Antonio, Texas	Roentgenology
Carroll, Wm. J., Maj.	Army and Navy Gen. Hosp., Hot Springs, Ark.	Roentgenology *
Favour, R., Jr., Maj.	Army and Navy Gen. Hosp., Hot Springs, Ark.	Roentgenology
Grady, Henry W., Maj.	Fitzsimons Gen. Hosp., Denver, Colo.	Roentgenology *
Kellogg, D. S., Capt.	Station Hosp., Schofield Barracks, Hawaii	Roentgenology *
Lowry, R. H., Jr., Maj.	Sternberg Gen. Hosp., Manila, P. I.	Roentgenology
McCaw, Wm. W., Maj.	Army Med. School, Army Medical Center, Washington, D. C.	Roentgenology *
Moore, H. C., Maj.	Hdqts. 9th Corps Area, Presidio of San Francisco, San Francisco, Calif.	Roentgenology
Moore, John J., Maj.	Letterman Gen. Hosp., San Francisco, Calif.	Roentgenology *

UNITED STATES NAVY

NAME	ADDRESS	TYPE OF SERVICE
Farrior, John B., Lt. Comdr.	Naval Hospital, Annapolis, Md.	Roentgenology
Fort, Walter A., Lt. Comdr.	U. S. Naval Hospital, Mare Island, Calif.	Roentgenology *
Hayworth, R. W., Lt. Comdr.	U. S. Naval Hospital, Washington, D. C.	Roentgenology *
Hutchinson, R. W., Lt. Comdr.	Naval Medical School, Washington, D. C.	Roentgenology
Jacobs, Irving W., Comdr.	U. S. Naval Hospital, Brooklyn, N. Y.	Roentgenology *
Keener, Harry A., Lt. Comdr.	U. S. Naval Hospital, Mare Island, Calif.	Diagnostic roent.
Larson, Gilbert H., Lt. Comdr.	U. S. Naval Hospital, Philadelphia, Pa.	Roentgenology *
Maher, Paul P., Lt. Comdr.	U. S. Naval Hospital, Pearl Harbor, Hawaii	Roentgenology *
Muller, F. W., Lt. Comdr.	U. S. N. Medical Supply Depot, Brooklyn, N. Y.	Roentgenology *
Noble, Harry J., Lt. Comdr.	U. S. Naval Hospital, Chelsea, Mass.	Roentgenology *
Owen, John P., Comdr.	U. S. S. Relief, Mare Island, Calif.	Roentgenology
Perry, Wendell H., Lt. Comdr.	Naval Hospital, Great Lakes, Ill.	Roentgenology
Pinner, Wm. E., Lt.	U. S. Naval Hospital, Bremerton, Wash.	Roentgenology
Raison, T. W., Capt.	Naval Medical Supply Depot, Mare Island, Calif.	Radiology
Spalding, Otis B., Lt. Comdr.	U. S. Naval Hospital, San Diego, Calif.	Roentgenology *
Stowe, Irving E., Lt. Comdr.	U. S. Naval Hospital, Portsmouth, N. H.	Roentgenology *
Whitehead, Ely L., Lt. Comdr.	U. S. Naval Hospital, Brooklyn, N. Y.	Roentgenology *
Whitmore, Wm. H., Lt. Comdr.	U. S. Naval Hospital, Canacao, Cavite, P. I.	Roentgenology

UNITED STATES PUBLIC HEALTH SERVICE

NAME	ADDRESS	TYPE OF SERVICE
Booth, J. H. R.	U. S. Marine Hospital, Baltimore, Md.	Roentgenology *
Mayoral, Antonio	U. S. Marine Hospital, New Orleans, La.	Roentgenology

VETERANS ADMINISTRATION

Beaudet, E. A.	Livermore, Calif.	Diagnostic roent.
Frank, C. Harold	Milwaukee, Wis.	Diagnostic roent.
Glickman, L. Grant	Minneapolis, Minn.	Roentgenology *
Griswold, Charles M.	Danville, Ill.	Diagnostic roent.
Hynes, Wm. P.	2650 Wisconsin Ave., N. W., Washington, D. C.	Radiology
McClanahan, C. W.	West Los Angeles, Calif.	Radiology
Minehart, V. L.	130 W. Kingsbridge Rd., New York City	Radiology
Moxness, B. A.	Northampton, Mass.	Roentgenology
Murray, R. S. E.	Lyons, N. J.	Roentgenology *
Nather, Frederick B.	Veterans Adm. For. Legion, Texas	Diagnostic roent.
Shawhan, Rezin C.	Oteen, N. C.	Diagnostic roent.

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SATURDAY, FEBRUARY 22, 1936

SENSITIVENESS AND RESISTANCE TO ROENTGEN RAYS OR RADIUM

Physicians who are not well versed in radiology often consider radiosensitiveness and radioresistance as absolute expressions. To them a tumor is either sensitive or resistant to irradiation, and intermediate gradations are not recognized. Experienced radiologists use these terms only in a relative sense. Just as different varieties of normal cells vary greatly in sensitiveness to roentgen rays or radium, tumors vary equally in this respect. It has been established that the radiosensitiveness of any tumor corresponds to that of the cells of which it is chiefly composed. The scale of radiosensitiveness of different varieties of neoplasms must, and does in fact, correspond to the degree of sensitiveness of its essential cellular constituents. In other words, the scale of radiosensitiveness of different varieties of tumor corresponds to the scale of sensitiveness of the different varieties of normal cells.

The normal lymphocytes are the most sensitive of all cells to irradiation; tumors composed mainly of lymphocytes are most sensitive to roentgen rays or radium. The sensitiveness of embryonal carcinoma of the kidney or testis is slightly less than that of lymphoid tumors. Next in relative sensitiveness comes endothelioma, or endothelial myeloma, of bone. At the opposite end of the scale of sensitiveness to irradiation must be placed tumors derived from nerve cells or from myxomatous tissue. In the case of a mixed tumor, sensitiveness to irradiation represents a composite of its cellular elements; when sensitive cells predominate, the degree of sensitiveness is greater than when the proportion of sensitive cells is small. Thus, between maximum sensitiveness and maximum resistance there are numerous gradations. Therefore to speak or to write of a tumor as sensitive or resistant to irradiation, without qualification to indicate the grade or relative degree of these qualities, is to mislead others into assuming that a tumor is either 100 per cent sensitive or 100 per cent resistant. Just as a mixture of different proportions of red and white may yield innumerable intermediate shades of color, so may different varieties of tumor exhibit varying degrees of sensitiveness or resistance according to the relative proportion of sensitive and resistant cells which they contain.

In estimating the relative sensitiveness of any tumor, two principal factors must be considered: the rate of regression and the scheme of irradiation. The significance of the first factor rests entirely on the second factor. One tumor may retrogress completely in two or three weeks; regression of another tumor may require two or three months; a third growth may not disappear completely, however prolonged the treatment may be, or may not be perceptibly influenced. Examples include lymphoblastoma, endothelioma of bone, osteogenic sarcoma and myxosarcoma.

The rate of regression of a new growth cannot well be compared with that of another unless the scheme of irradiation is approximately the same. This refers not only to the quantity and quality of rays to which the affected region has been exposed but also, and perhaps even more, to the arrangement of the fields of irradiation and the direction of the several beams of rays in relation to the tumor.

Another general statement often made is that neoplasms corresponding to grades 3 and 4 of Broders' scale of malignancy are radiosensitive, while neoplasms corresponding to grades 1 and 2 are resistant to irradiation. This represents a conclusion drawn from purely pathologic premises; its validity is at least doubtful. It represents a half truth which takes into account only a part of the equation. In this connection it is essential to remember that histopathologic structure and cellular radiosensitiveness are different bases which do not necessarily have anything in common. The one rests on the visual appearance of cells and the architectural arrangement of tissues, while the other rests on the innate sensitiveness of cells to roentgen rays or radium. In a general way it is true that the more malignant the tumor the more sensitive it is likely to be; but to deduce that only tumors with a malignancy corresponding to grades 3 and 4 of Broders' scale should be irradiated is to draw altogether too broad a conclusion.

FIRST AID TREATMENT OF FRACTURES

The emergency treatment of fractures of the long bones has become a problem of major importance. Scattered along the highways of the nation each year are more than a million persons injured by automobile accidents, and in the homes of the nation there are more than four million additional persons injured. Many of these are suffering from fractures of the long bones. About 300,000 fractures of the extremities occur annually in this country. In comparison with the number of injured in the American forces during the World War, the annual number of peace time injuries is gigantic. The first aid treatment of this vast number of injured persons, particularly those who have fractured bones, will largely determine in many cases the amount of pain, the length of their stay in the hospital,

and to some extent whether or not they are permanently disabled. The first attendant to practically all these injured persons naturally will be laymen untrained in the care of fractures. Their first thought will be to lift and carry the victim, with perhaps his broken extremity dangling, to some place more comfortable than the roadside. As regards the eventual result to fractured limbs, this is the worst thing that could be done. The immediate effects will be additional injury by the jagged bones to nerves, blood vessels and muscles. The broken bones may thus be forced through the skin, creating a compound fracture and tremendously increasing the risk of infection and the danger to life. Injured persons with broken bones should first have a splint properly applied to the extremity before they are moved.

The Cooperative Committee on Fractures of the Section on Surgery, General and Abdominal, and the Section on Orthopedic Surgery of the American Medical Association has prepared in cooperation with the Department of Scientific Exhibit a Primer on Fractures in which the principles of the modern treatment of fractures are illustrated and discussed. The Cooperative Committee on Fractures also will reestablish at the Kansas City session of the American Medical Association in May the fracture exhibit, which for several years attracted the attention of thousands of physicians in attendance at the annual meetings.

Proper instruction in the first aid treatment of fractures is of increasing importance. A campaign of instruction is under way throughout the country by such organizations as the Red Cross, the Girl and Boy Scouts, nurses' organizations, and many large industrial groups. The leadership in the teaching of first aid is naturally in the medical profession. Medical practitioners must therefore become proficient in giving and teaching first aid. Medical schools are insisting, and the groups established for graduate instruction must demand, that students possess the ability to apply emergency fixed traction splints. The teaching of first aid today is different from the old-fashioned attempts to teach the simple application of a folded handkerchief bandage. Cities are passing ordinances to require ambulances, police cars and other conveyances to carry first aid splints.

An official history of the war [1] said:

> It has always been recognized that the fixation of the broken bone at the earliest possible moment after the injury is important, but it was not until 1915 that it became clearly recognized how much the subsequent satisfactory progress of any case of gunshot fracture depended on efficient splinting prior to transport. The appreciation of this fact was chiefly due to the demonstration afforded by the use of the Thomas knee-splint in the treatment of fractures of the femur. Fractures of this class were, in the early days of the war, fixed in the forward area by some splint of the long outside type. Mortality among patients so treated was extraordinarily high, and those cases which recovered were almost all subject to severe infections and a prolonged convalescence. After the general introduction in the forward areas of the Thomas splint for the treatment of this fracture, the improvement in results was too great not to attract attention. Apart from any advance which had been effected in wound treatment in general, it was clearly shown that an apparatus which fixed a fracture was able largely to prevent shock and to reduce the incidence of infection in the wound.

According to Dr. Kellogg Speed, chairman of the Cooperative Committee on Fractures, the World War furnished proof of the reduction in mortality in major open fractures from 80 per cent to 20 per cent, with the help of this means of transportation. The principles of the Thomas splint remain sound and some modifications have also been found acceptable. The day will probably come when every public vehicle and every doctor's car will carry the proper splints for fixed traction in first aid transportation.

1. History of the Great War, London, His Majesty's Stationery Office 1: 195, 1922.

COPPER AND PIGMENTATION OF SKIN AND HAIR

Pronounced changes occur in the color of the fur of black or "hooded" rats that consume an exclusive milk diet low in copper.[1] A progressive decrease in the amount of pigmentation occurred as the dietary regimen continued until finally the coat became a silvery gray. The administration of iron to the animals had no effect on the condition, but the feeding of a small amount of copper promoted a prompt restoration of the normal color to the fur. Almost simultaneously, another investigator [2] demonstrated by actual analyses that the copper content of the skin of black rats and rabbits usually exceeded that of otherwise comparable white animals. Further studies suggested that copper might serve as a catalyst in the formation of pigment. Copper, it was shown, markedly accelerated the oxidation of "dopa," l-3-4-dihydroxyphenylalanine, by "dopa oxidase," an enzyme present in the skin of young animals, forming a dark pigment. Even in the absence of the enzyme, the oxidation was catalyzed by copper to some extent.

Recent investigations have confirmed and extended these observations. A Japanese investigator [3] has demonstrated that the copper content of black skin and hair is somewhat greater than that of brown skin and hair, which in turn exceeds white skin and hair in this respect. This relationship held even in instances in which skin and hair varying in degree of pigmentation were taken from different areas of the same animal. It was also found that amounts of copper as small as 0.05 microgram catalyzed the in vitro oxidation of "dopa" to a dark colored pigment.

Gorter [4] likewise relates copper to the pigmentation of skin and hair. Striking depigmentation of the fur

1. Keil, H. L., and Nelson, V. E.: The Rôle of Copper in Hemoglobin Regeneration and in Reproduction, J. Biol. Chem. **93**: 49 (Sept.) 1931.

2. Cunningham, I. J.: Some Biochemical and Physiological Aspects of Copper in Animal Nutrition, Biochem. J. **25**: 1267 (No. 4) 1931.

3. Sarata, U.: Studies in the Biochemistry of Copper: XI. Copper and Pigmentation of Skin and Hair, Japanese J. M. Sc., II. Biochemistry **3**: 79 (Nov.) 1935.

4. Gorter, F. J.: Depigmentation, a New Dietary Deficiency Disease Cured by Copper, Nature **136**: 185, 1935.

of cats, rabbits and rats was produced by dietary means and the condition was specifically cured by copper. A number of other inorganic elements, tested either alone or in various combinations, and certain vitamins were inert as remedial agents. While further work must be done before conclusions are drawn, these observations strongly suggest that copper may be related, perhaps as a catalyst, to the formation of pigment in the skin and hair of mammals.

Current Comment

CERTIFICATION OF RADIOLOGISTS

At the Minneapolis session of the American Medical Association in 1928 the House of Delegates assigned to the Council on Medical Education and Hospitals the work of preparing a list of acceptable radiologic laboratories and departments of radiology. This was in response to requests from the sections on radiology of several medical societies for a supervision similar to that already established over clinical laboratories. Since greatest emphasis was placed on the qualifications of radiologists in charge of such laboratories, "Essentials for Admission to List of Physicians Specializing in Radiology" were formulated and were adopted by the House of Delegates. This provided a basis for the Council's list of radiologists. The list was first published in THE JOURNAL in 1931; the sixth and final publication of the list containing 1,286 names, appears elsewhere in this issue. The local advisory committees of radiologists played an important part in developing the Council's list. The regular publication of the list since 1931 has been a great influence in advancing the specialty of radiology to the position in scientific medicine it now occupies. Physicians everywhere have been encouraged to refer their work to medical graduates recognized as specialists in this field. There is evidence that independent lay practitioners have been effectively curbed. The principles proclaimed in the "Essentials for Admission to List of Physicians Specializing in Radiology" and otherwise have been an educational force, and they have confirmed the fact that the practice of radiology is the practice of medicine. The American Board of Radiology, which was established in 1933, conducted its first examinations at Cleveland in 1934. The board at present is composed of the following doctors of medicine: H. K. Pancoast, Philadelphia, president; A. C. Christie, Washington, D. C., vice president; E. C. Ernst, St. Louis; G. W. Holmes, Boston; E. L. Jenkinson, Chicago; L. C. Kinney, San Diego, Calif.; W. F. Manges, Philadelphia; L. J. Menville, New Orleans; J. W. Pierson, Baltimore; L. R. Sante, St. Louis; Henry Schmitz, Chicago; Albert Soiland, Los Angeles; M. C. Sosman, Boston; R. H. Stevens, Detroit, and B. R. Kirklin, Rochester, Minn., secretary-treasurer, to whom applications should be directed. The Council on Medical Education and Hospitals of the American Medical Association officially extended its recognition to this board, Dec. 9, 1935. Therefore the list of diplomates of the American Board of Radiology will henceforth take the place of the Council's list of radiologists.

DETECTION OF ENDEMIC FLUOROSIS

The remarkable development of knowledge concerning the rôle of fluorine in causing mottled enamel has been previously discussed in these columns.[1] Definite evidence now exists associating the presence of fluoride in drinking water with the endemic hypoplasia of the permanent teeth known as mottled enamel. It is important therefore to determine what constitutes a noninjurious amount of fluoride in a domestic water supply. Any attempts to arrest the further development of this disease are obviously based on definite information concerning the permissible maximum or minimum threshold values for the fluorine content of the water regularly consumed. For public health purposes it is important to establish an arbitrary minimal threshold of fluoride concentration in domestic water supplies so that data obtained in various localities may be related to this norm. The minimal threshold of fluoride concentration has been defined by the United States Public Health Service laboratories as the highest concentration of fluoride incapable of producing a definite degree of mottled enamel in as much as 10 per cent of the group examined.[2] The group studied should consist of at least twenty-five children and is restricted, in general, to children 9 years of age or older who, since birth, have continuously used the water under investigation for both drinking and cooking. A community is given a "negative" mottled enamel index when less than 10 per cent of the children show "very mild" or more severe types of mottled enamel. With these useful criteria, studies have already been made of endemic fluorosis in eleven cities, six where mottled enamel was known to be endemic and five in which comparable conditions existed but without evidence of the typical dental defects in the population and which served as "controls." Owing to the fluctuating content of fluoride in certain municipal water supplies, caution should be exercised in correlating clinical observations with a single chemical determination of fluoride in the water. Furthermore, care must be taken in obtaining the full details of the case histories, as continuous residence in the suspected regions is of great importance in eliciting the abnormalities in the dental structures. On the basis of the foregoing combination of criteria, two municipalities in Illinois with a mean annual fluoride content of 1.7 and 1.8 parts per million in the water, and one city in Colorado with 2.5 parts per million were given a mottled enamel index of "slight," whereas one city in Colorado with 0.6 part per million was listed as "negative." The interesting results and relationships derived from these studies and the application of this method of approach to other regions of this country will undoubtedly provide valuable information regarding endemic fluorosis and indicate the localities in which it is necessary to remove toxic quantities of fluorides from the drinking water.

1. Mottled Enamel, editorial, J. A. M. A. **100:** 189 (Jan. 21) 1933. The Oakley Experiment on Mottled Enamel, ibid. **101:** 214 (July 15) 1933.

2. Dean, H. T., and Elvove, Elias: Pub. Health Rep. **50:** 1719 (Dec. 6) 1935.

Association News

RADIO BROADCASTS

The American Medical Association broadcasts over WEAF, the Red network instead of the Blue, as formerly, and certain additional stations of the National Broadcasting Company at 5 p. m. eastern standard time (4 o'clock central standard time, 3 o'clock mountain time, 2 o'clock Pacific time) each Tuesday, presenting a dramatized program with incidental music under the general theme of "Medical Emergencies and How They Are Met." The title of the program is "Your Health." The program is recognizable by a musical salutation through which the voice of the announcer offers the toast "Ladies and gentlemen, your health!" The theme of the program is repeated each week in the opening announcement, which informs the listener that the same medical knowledge and the same doctors that are mobilized for the meeting of grave medical emergencies are available in every community, day and night, for the promotion of the health of the people. Each program will include a brief talk dealing with the central theme of the individual broadcast.

Red Network.[1]—The stations on the Red network of the National Broadcasting Company are WEAF, WEEI, WTIC, WJAR, WTAG, WCSH, KYW, WFBR, WRC, WGY, WBEN, WCAE, WTAM, WWJ, WMAQ, KSD, WHO, WOW, WDAF.

Pacific Network.[1]—The stations on the Pacific network are KGO, KPO, KFI, KGW, KOMO, KHQ, KFSD, KTAR.

The next three programs are as follows:

February	25.	Crippled Children, W. W. Bauer, M.D.
March	3.	Cancer, W. W. Bauer, M.D.
March	10.	Hard of Hearing, Morris Fishbein, M.D.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Society News.—Dr. Beverly Douglas, Nashville, Tenn., addressed the Tuscaloosa County Medical Society and medical students at the University of Alabama, February 3, on "Recent Advances in Treatment of Common Wounds and Wound Infection."

Personal.—Dr. Robert E. Harper, for ten years health officer of Lawrence County, has resigned to accept a similar position in Colbert County, with headquarters at Tuscumbia. ——Dr. Paul M. Thompson, formerly of Spartanburg, S. C., has been appointed health officer of the recently created health unit in Henry County.

CALIFORNIA

Lectures on Mental Health.—Dr. Frankwood E. Williams, formerly medical director of the National Committee for Mental Hygiene, New York, is to give a series of four lectures on "Mental Health and Social Forces," February 24, 25, 26 and 28, at the Figueroa Playhouse, Los Angeles.

Hospital News.—Dr. Stanley Cobb, Bullard professor of neuropathology, Harvard Medical School, Boston, discussed "Epilepsy and the Convulsive State" at the University of California Hospital, San Francisco, February 8. Dr. Willis C. Campbell, professor of orthopedic surgery, University of Tennessee College of Medicine, Memphis, gave a lecture, February 4, on "Surgical Disorders of the Knee."

Outbreak of Influenza.—A mild type of influenza resulted in the closing of three schools in the Los Angeles area and a quarantine of Juvenile Hall, police detention home for minors, the Chicago *Tribune* reported February 16. More than 100 children and thirteen staff members were reported ill at the institution. Whittier High School, Antelope Valley High School and Norwalk Grammar School were closed.

Society News.—Dr. Roger Anderson, Seattle, will address the Alameda County Medical Association, March 5, on "Fractures of the Upper and Lower Extremities." A symposium on diseases of the thyroid gland was presented before the society, February 17, by Drs. Paul P. E. Michael, George E. Nesche and Frank H. Bowles, Oakland.——Dr. Arthur B. Cecil, Los Angeles, addressed the San Diego County Medical Society, February 11, on "Deformities of the Male Urethra."

CONNECTICUT

Dr. Phelps Retires as Professor.—Dr. Winthrop M. Phelps will retire in June from Yale University School of Medicine, New Haven, as professor of orthopedic surgery and become a clinical professor, devoting only part time to the medical school, the New York *Times* reported February 8. Dr. Phelps graduated from Johns Hopkins University School of Medicine, Baltimore, in 1920. He has been a professor at Yale since 1932 and a member of the faculty since 1925.

Society News.—Dr. Albert Buck, superintendent of New Haven Hospital, was elected president of the Connecticut Hospital Association at the recent annual meeting.——Dr. Bernardo A. Houssay, professor of physiology and director of the Institute of Physiology, National University of Buenos Aires, addressed a special meeting of the Yale Medical Society, New Haven, January 18, on "The Hypophysis and Carbohydrate Metabolism." Speakers before the society, February 12, included Charles-Edward A. Winslow, Dr.P.H., Lovic P. Herrington Jr., Ph.D., and A. P. Gagge on "Measurement of Thermal Interchanges Between the Body and Its Environment by Differential Calorimetry"; Drs. Monroe D. Eaton, "The Nature of Diphtheria Toxin"; Ashley W. Oughterson, "Spinal Cord Level of Preganglionic Fibers in Relation to Horner's Syndrome," and Edwin F. Gildea and Evelyn B. Man, Ph.D., "The Relation Between Blood Lipoids and Body Build."

DISTRICT OF COLUMBIA

Medical Bills in Congress.—S. 3514 has been reported to the Senate, with amendment, proposing to regulate the manufacture, dispensing, sale and possession of narcotic drugs in the District of Columbia (S. Rept. 1538). H. R. 8437 has been reported to the Senate, without amendment, directing the Commission on Licensure to Practice the Healing Art in the District of Columbia to issue a license to Dr. Arthur B. Walker.

Health at Washington.—Telegraphic reports to the U. S. Department of Commerce from eighty-six cities with a total population of 37 million, for the week ended February 8, indicate that the highest mortality rate (23.1) was for Washington and for the group of cities as a whole, 13.4. The mortality rate for Washington for the corresponding period last year was 16.4, and for the group of cities, 13.1. The annual rate for eighty-six cities for the six weeks of 1936 was 13.4 as against a rate of 13.1 for the corresponding period of the previous year. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

Society News.—The Medical Society of the District of Columbia was addressed, February 12, by Drs. Panigiotes S. Constantinople on "Chronic Otitis Media"; Harry S. Bernton, "The Common Cold and Asthma," and Elizabeth Parker and Harry S. Douglas, "Acromegaly." A symposium on cardiac pain was presented before the society, February 19, by Drs. Louis Hamman, Baltimore, Earl A. Martin and Joseph Duerson Stout. Dr. Alfred L. Abrams will present a paper February 26, entitled "Epidemic Poliomyelitis in Washington: Clinical Survey with Emphasis on Diagnostic Features," and Dr. Earl B. McKinley, "The Geography of Disease."——Dr. Robert A. Wilson, Brooklyn, discussed "A Study of the Asphyxia and Early Respirations of the New-Born" before the Washington Gynecological Society, January 25.

ILLINOIS

Society News.—Speakers at the quarterly meeting of the Henry County Medical Society in Cambridge, February 13, were Drs. Ford K. Hick and Charles M. McKenna, both of Chicago, on pneumonia and prostatitis, respectively.——At a meeting of the Perry County Medical Society in DuQuoin, February 6, Drs. Quitman U. Newell and Oswald P. J. Falk, St. Louis, discussed cancer and cardiovascular diseases.——Dr. Frederick G. Dyas, Chicago, discussed goiter before the DuPage County Medical Society in Elmhurst, January 15.

1. Network programs are broadcast locally or rejected at the discretion of the local station. The lists indicate stations to which programs are available.

Chicago

Dr. Abt Donates Library to Medical School.—Dr. Isaac A. Abt, professor of pediatrics, Northwestern University School of Medicine, has presented his library on the diseases of children, collected over a period of forty years, to Northwestern. The collection comprises 3,500 volumes and is valued at approximately $25,000.

Chicago Medical Society Endorses Dr. Humiston.—The council of the Chicago Medical Society, February 11, adopted a resolution endorsing Dr. Charles E. Humiston as candidate for president-elect of the American Medical Association. The resolution reads as follows:

WHEREAS, The Illinois State Medical Society through its Council by unanimous vote has endorsed Dr. Charles E. Humiston as candidate for President-Elect of the American Medical Association and instructed its Delegates to urge his election at the Kansas City meeting; therefore be it

Resolved, By the Council of the Chicago Medical Society in regular meeting assembled, that said action of the Illinois State Medical Society in recognizing the superior qualifications of our distinguished fellow member for the high office of President of the American Medical Association be, and hereby is, commended, approved and endorsed.

Supreme Court Holds Corporate Practice of Medicine Illegal.—The Supreme Court of Illinois, February 14, in *People v. United Medical Service, Inc.*, held that a corporation cannot legally practice medicine in Illinois even though it attempts to do so through physician-employees. It accordingly affirmed a judgment rendered by Judge M. L. McKinley of the Superior Court, Cook County, March 1935, ousting the United Medical Service Corporation from "the franchise, occupation and business" of engaging in the diagnosis and treatment of human ailments. According to the Chicago *Tribune*, February 15, an attempt will be made to reorganize the corporation on a partnership basis, in the hope of avoiding legal difficulties. It is intimated, however, that before attempting such a reorganization the corporation may ask for a rehearing from the Supreme Court of Illinois and appeal, if possible, to the Supreme Court of the United States.

Society News.—Speakers before the Chicago Medical Society, February 8, were Drs. Harry Culver on "Borderline Problems in Diagnostic Urology"; Joseph S. Eisenstaedt, "Bladder Tumors," and Herman L. Kretschmer, "Transurethral Resection in Various Types of Bladder-Neck Obstruction."——At a meeting of the Chicago Pathological Society, February 10, Francis B. Gordon and Dan H. Campbell, department of bacteriology, University of Chicago, among others, were the speakers on "Active and Passive Immunity in Experimental Poliomyelitis" and "Antigenic Polysaccharides from Helminths," respectively.——The Chicago Roentgen Society was addressed, February 13, by Drs. Alfred E. Jones and Philip Rosenblum on "Foreign Bodies in the Genito-Urinary Tract," and Warren W. Furey, "Intestinal Obstruction as a Roentgenological Problem."——Dr. Robert D. Schrock, Omaha, discussed "Treatment of Sprengel's Deformity" and "Immediate Bone Grafting Following Resection of Benign Bone Tumors" at a meeting of the Chicago Orthopedic Society, February 14. Dr. Samuel J. Lang discussed "The Mechanics of the Back and Its Relation to Backache."——Among others, Dr. Edward V. L. Brown addressed the Chicago Ophthalmological Society, February 17, on "The Apparent Increase of Hyperopia Before Nine Years of Age."——A symposium on contact dermatitis was presented before the Chicago Society of Allergy, February 17, by Drs. Samuel J. Zakon, Chicago, Louis A. Brunsting, Rochester, Minn., and Carliss Malone Stroud, St. Louis.

INDIANA

Society News.—Dr. James B. Shoemaker, Miami, addressed the Miami County Medical Society in Peru, January 31, on "Protein Therapy."——Speakers before the Madison County Medical Society, Anderson, February 17, included Drs. Sam W. Litzenberger, on "Hormone Treatment of Prostatic Hypertrophy"; Otis A. Kopp, "Overtreatment of Syphilis"; Rex W. Dixon, "Systemic Allergic Reactions," and Archie D. Erehart, "Sinus Infections or Nasal Allergy."

State Board Reelected.—The Indiana State Board of Medical Registration and Examination reelected all officers at the annual meeting in January: Dr. Jesse W. Bowers, Fort Wayne, president; Dr. Leslie C. Sammons, Shelbyville, vice president; Dr. William R. Davidson, Evansville, secretary, and Cecil J. Van Tilburg, D.C., Indianapolis, treasurer. Other members of the board are E. O. Peterson, D.O., La Porte; Dr. Norris E. Harold, Indianapolis, and Dr. Franklin S. Crockett, Lafayette.

New Medical School Building.—The *Journal of the Indiana State Medical Association* announces that a new medical school building will be constructed on the Bloomington campus of Indiana University, to be erected as a federal project at the university at a cost of $471,000. It will be named the James William Fesler building in honor of the president of the board of trustees of the university, in recognition of his services as a member of the board since 1902 and president since 1919.

MARYLAND

Curative Workshop.—Occupational therapy has recently been made available to outpatients at the University Hospital, University of Maryland, Baltimore, through the opening in the dispensary of a curative workshop, under the auspices of the Junior League of Baltimore. Suitable equipment has been installed. The department is under the direction of Miss Sue Hurt, a graduate of the Philadelphia School of Occupational Therapy.

Dr. Lomas Honored.—A banquet was held in honor of Dr. Arthur J. Lomas, superintendent of the University Hospital, Baltimore, at the Southern Hotel, January 7, as a tribute to his efforts in erecting the new hospital building. Dr. William H. Toulson acted as toastmaster; the speakers included Mr. H. C. Byrd, acting president of the University of Maryland; Dr. James M. H. Rowland, dean of the medical school, and Dr. Arthur M. Shipley, who presented Dr. Lomas with a token of esteem.

Memorial to Dr. Ruhräh.—A memorial room was opened in the building of the Medical and Chirurgical Faculty of Maryland, January 21, in honor of the late Dr. John Ruhräh, Baltimore. The room was furnished by friends of Dr. Ruhräh, principally outside the medical profession, and it is hoped ultimately to make this room a replica of the one in which he lived and worked for the last twenty-five years of his life. Many of his own books have been placed in the room, which will be formally dedicated at the annual meeting of the faculty in April. The opening of the room was a feature of the meeting of the Osler Historical Society. Dr. Sanford V. Larkey, librarian, Welch Medical Library, Johns Hopkins University, spoke on "Children and Witches," and Dr. John Rathbone Oliver presented "An Unpublished Autograph Letter of Dr. John Crawford." Dr. Ruhräh, who died March 10, 1935, provided in his will that most of his estate will eventually go to the faculty. Among other positions he was professor of pediatrics at the University of Maryland School of Medicine; president of the American Pediatric Society, American Academy of Pediatrics and the Medical and Chirurgical Faculty of Maryland; president and secretary-treasurer of the Medical Library Association, and president of the Research Society of the Osler Historical Society.

MASSACHUSETTS

Personal.—A testimonial dinner was given to Dr. Henry M. Pollock, superintendent, Massachusetts Memorial Hospitals, at the Parker House, January 30, by about 300 associates and friends of the Massachusetts Memorial Hospitals. Dr. Pollock is an associate commissioner of the department of mental diseases.——Drs. Austen F. Riggs and Charles H. Kimberly have been appointed to the staff of the Williams College health department, Williamstown.

British Physician to Lecture at Harvard.—Sir Frederick Gowland Hopkins, Sir William Dunn professor of biochemistry at the University of Cambridge, England, and since 1914 professor of biochemistry, has been appointed to the Harvard faculty for the academic year beginning next September. As the Edward K. Dunham annual lecturer, he will deliver a series of lectures in the medical school. The Dunham foundation was established in 1923 for the promotion of the medical sciences. Holders of the lectureship are drawn chiefly from among the leaders of foreign medical research. The Nobel Prize in medicine was conferred on Sir Frederick in 1929.

Free Public Lectures.—The faculty of Harvard Medical School began a series of free public lectures on medical subjects, January 5, when Dr. Daniel F. Jones discussed cancer. Lectures to be given in the future will be:

Dr. Henry Jackson Jr., February 23, Rôle of the White Blood Cells in Health and Disease.
Dr. Reginald Fitz and Dr. Elliott C. Cutler, March 1, Appendicitis.
Dr. William B. Castle, March 8, Vitamins.
Dr. Hallowell Davis, March 15, Hearing and Its Conservation.
Dr. Herbert L. Lombard, March 22, Chronic Disease at the Cross Roads.

Other lectures in the series were given by Drs. John H. Blaisdell, "Cosmetics—Safe and Dangerous"; Harold C. Stuart, "Prevention of Infectious Diseases"; William L. Aycock, "Infantile Paralysis"; Leroy M. S. Miner, "Prevention and Treatment of Physical Diseases of the Mouth"; Francis C. Hall, "Gout and Allied Conditions," and William H. Robey, "The Prospect of Keeping a Good Heart."

MICHIGAN

State Society Night.—Several county medical societies in Michigan have adopted the plan of designating one of their meetings "state society night" when officers of the state society are guests of honor and participate in the program. The Jackson County Medical Society devoted its meeting, January 21, to this program; Muskegon County, January 31, and Genesee County, February 19. Wayne County plans its "state society night" for some time in March.

Graduate Conferences.—Graduate conferences are being held each Wednesday morning during February at the Herman Kiefer Hospital, Detroit, under the auspices of the joint committee of the Wayne County Medical Society, the Detroit Tuberculosis Sanatorium and the department of health. Topics have been the pathology of tuberculosis and scarlet fever, February 5; preventive measures in tuberculosis and whooping cough, February 12; diagnosis (childhood and adult tuberculosis) and diphtheria, February 19. Differential diagnosis of tuberculosis and anterior poliomyelitis will be the subject, February 26.

Personal.—Dr. Vladimir K. Volk has resigned as deputy health commissioner of Oakland County to become health officer of Saginaw County; he is a past president of the Oakland County Public Health Association. A farewell dinner was given in his honor, January 29.——Dr. Howard H. Cummings, Ann Arbor, has been made assistant director of graduate medical education at the University of Michigan Medical School, Ann Arbor.——A testimonial dinner was given in honor of Dr. Arthur O. Hart, St. Johns, January 21, by members of the staff of Clinton Memorial Hospital and others. An inscribed scroll was presented to Dr. Hart, expressing appreciation of his many years' service in the community.

MINNESOTA

Barber Wanted for Forgery.—Olaf Edwardson, a barber, is wanted by the Minneapolis police for forgery, according to *Minnesota Medicine*. He is said to have imposed on a number of physicians throughout the state. He is described as 40 years of age, 5 feet 7 inches tall, weighing 155 pounds; he has medium dark chestnut hair, medium dark blue eyes, medium complexion, is bald and is of Norwegian descent.

Dr. Mann to Give Judd Lecture.—The third annual lecture in the E. Starr Judd Lectureship in Surgery, established at the University of Minnesota by the late Dr. Judd, will be given by Dr. Frank C. Mann, professor of pathologic surgery and experimental physiology, Mayo Foundation, March 17, in the Music Auditorium on the university campus in Minneapolis. The lecture will be entitled "Hepatic Physiology and Pathology from the Surgical Viewpoint: A Review of Experimental Investigations."

Society News.—Dr. Frank H. Lahey, Boston, addressed the Minneapolis Surgical Society, February 6, at its fourteenth annual foundation dinner; his subject was "The Surgery of Carcinoma of the Colon and Rectum." Honorary membership was given to Drs. William J. and Charles H. Mayo, Rochester, at this meeting.——Dr. Robert D. Mussey, Rochester, presented a paper before the Minnesota Academy of Medicine in St. Paul, February 12, on "Relation of Retinal Changes to the Severity of the Acute Toxic Hypertensive Syndrome of Pregnancy," and Dr. Arthur W. Ide, "Rupture of the Bowel from Compressed Air."——The Minnesota Hospital Association will hold its annual session at the Lowry Hotel, St. Paul, May 14-16.——Dr. Charles H. Watkins, Rochester, addressed the annual meeting of the Winona County Medical Society in January on "Diagnosis and Treatment of Anemia."

MISSISSIPPI

Bills Introduced.—S. 223 and H. 213 propose to create a state hospital commission to allocate and disburse such funds as may be appropriated by the state for the hospitalization of indigent sick. This commission is to be authorized to prescribe the conditions under which hospitals may receive state appropriations and to regulate the operation of such hospitals.

NEBRASKA

Society News.—Dr. Robert S. Dinsmore Jr., Cleveland, gave an address before the Omaha-Douglas County Medical Society, Omaha, February 11, entitled "Résumé of the Thyroid Problem." At a joint meeting of the society with the Omaha District Dental Society, February 25, speakers will be Arthur C. Wherry, D.D.S., Salt Lake City, on "A Recent Study of Health Insurance in Europe," and Mr. M. C. Smith, Curtis, executive secretary of the Nebraska State Medical Association, on "The Future of the Practice of Medicine."——The third councilor district of the Nebraska State Medical Association held a meeting in Beatrice, January 23, with the following speakers: Dr. Abram E. Bennett, Omaha, "Present Status of Fever Therapy"; Dr. Ernest L. MacQuiddy, Omaha, "Mold Simulating Common Infections." Dr. Earl C. Sage, Omaha, gave a lecture on "The Mechanism of Labor."——Dr. Bert W. Pyle discussed fractures at a meeting of the Dawson County Medical Society, Gothenburg, January 6.——Dr. Leo J. Hombach, North Platte, addressed the Lincoln County Medical Society, North Platte, January 9, on "Sinus Infections."——The Garden-Keith-Perkins Counties Medical Society was recently organized with Dr. Firman M. Bell, Grant, as president and Herbert A. Blackstone, Lewellen, secretary.

NEW YORK

Medal in Ophthalmology.—The University of Buffalo gold medal is awarded annually to the author of a work in ophthalmology. Details may be obtained from Dr. Harold W. Cowper, 543 Franklin Street, Buffalo.

Society News.—Dr. Alexander Marble, Boston, addressed the Medical Society of the County of Westchester, White Plains, February 18, on "Practical Points in the Treatment of Diabetes in Hospital and Home."——Dr. Edgar M. Neptune, Syracuse, among others, addressed the Onondaga Medical Society, February 4, on carcinoma of the colon.——Dr. Josephine B. Neal, New York, addressed the Medical Society of the County of Nassau, January 28, on "Diagnosis and Treatment of Meningococcic Meningitis."

Bills Introduced.—S. 867, to amend the pharmacy practice act, proposes that the provisions of the act shall not apply "to the manufacture of proprietary medicines except those which are poisonous, deleterious and/or habit forming." S. 829 proposes to grant to physicians, nurses and hospitals, supported in whole or in part by charity, treating persons injured through the fault of others, liens on any judgments, settlements or compromises obtained by the injured persons by reason of their injuries. S. 830 and A. 963 propose to accord to hospitals, supported in whole or in part by charity and treating persons injured through the fault of others, liens on all judgments, settlements or compromises accruing to the injured persons by reason of their injuries.

New York City

Afternoon Lectures at the Academy.—The series of Friday afternoon lectures at the New York Academy of Lectures will be as follows for the remainder of the season:

Dr. Irving S. Wright, Diagnosis and Treatment of Peripheral Vascular Disease, March 6.
Dr. Nathan Rosenthal, Agranulocytosis with Special Reference to Hematology, Etiology and Treatment, March 13.
Dr. Foster Kennedy, Diagnosis and Treatment of Syphilis of the Central Nervous System, March 20.
Dr. Abraham L. Garbat, Ambulatory Treatment of Peptic Ulcer, March 27.
Dr. Gregory Shwartzman, Recent Advances in Treatment of Bacterial Infections, April 3.

Chest Examinations of School Children.—Roentgenograms will be taken of students in the fourth, fifth, sixth and seventh terms of the twenty-two high schools in Brooklyn, in a joint undertaking by the New York City departments of education and health, the Medical Society of the County of Kings and the Brooklyn Tuberculosis and Health Association. About 60,000 pupils are registered in these groups. New Utrecht High School has been tentatively selected as the institution where the first roentgen examinations will be made, February 24. It will take about three months to complete them. The rapid x-ray survey method will be used and parents will be asked to pay a nominal sum of $1 for the examinations. This fee covers the taking of the roentgenogram, interpretation by technicians designated by the county medical society, and a report of the results to the family physician in all cases in which medical care and treatment are needed.

Society News.—A symposium on "The Etiology of Neoplasms" was presented at a joint meeting of the New York Pathological Society and the section of medicine of the New York Academy of Medicine, February 18, by Clara J. Lynch, Ph.D., and Drs. Francis Carter Wood and James B. Murphy.——Drs. Frederic E. B. Foley, St. Paul, and Cyril K. Church addressed the section of genito-urinary surgery of the New York Academy of Medicine, February 19, on "A New Operation for Stricture at the Ureteropelvic Junction" and "Nephroptosis: Analysis of Palliative and Operative Treatment in 266 Cases" respectively. At a meeting of the section of gynecology and obstetrics, February 25, speakers will be Drs. John Mann, Toronto, on "Mechanical Principles in the Management of Occipitoposterior Positions"; Charles O. McCormick, Indian-

apolis, "Analgesia in Labor: A Modified Gwathmey Technic," and Anthony Wollner, "A Preliminary Study of the Histologic Changes in the Human Cervical Mucosa."——Drs. Stella S. Bradford, Montclair, N. J., and Heinrich F. Wolf presented papers before the New York Physical Therapy Society, February 5, on "Exercise in the Treatment of Arthritis" and "Methods of Reeducation in Neurologic Conditions" respectively.——The New York Heart Association held a scientific meeting, January 28, with Drs. William S. McCann, Rochester, and Minnie Jane Sands Robb, Syracuse, as speakers on "Cardiac Disorders in Chronic Pulmonary Disease" and "Studies of Cardiac Conduction" respectively.

OHIO

Yellow Fever Volunteer Dies.—Levi E. Folk, Columbus, a volunteer in the group of yellow fever experiments conducted in Cuba by the U. S. Army Commission under Major Walter Reed, in 1900-1902, died February 8 after a long illness, aged 66. Folk, a private in the hospital corps, volunteered to be bitten by infected mosquitoes and was taken with yellow fever Jan. 23, 1901. Folk was one of several volunteers who received gold medals and pensions of $125 per month authorized by Congress in 1929. The medals were presented in 1931 (THE JOURNAL, Dec. 5, 1931, p. 1718).

Society News.—Dr. Marion A. Blankenhorn, Cincinnati, addressed the Clinton County Medical Society, Wilmington, January 8, on "General Aspects of Deficiency Diseases."——Drs. Ralph Deming, Paul M. Holmes and William A. Neill, Toledo, addressed the Sandusky County Medical Association, Green Springs, January 30, on tuberculosis.——Dr. Albert Graeme Mitchell, Cincinnati, discussed "Nutritional Requirements and How to Fulfil Them" at a joint meeting of the Miami and Shelby County Medical Societies in Troy, January 2.——Dr. Chesterfield J. Holley, Wheeling, W. Va., addressed the Guernsey County Medical Society, Cambridge, January 2, on "Diagnosis of Carcinoma of the Colon."——Dr. George I. Nelson, Columbus, spoke on pneumonia at a meeting of the Hempstead Academy of Medicine, Portsmouth, January 13.——Dr. Albert C. Furstenberg, Ann Arbor, Mich., addressed the Columbus Academy of Medicine, January 6, on "Acute Infection of the Mouth, Throat and Neck."——Dr. M. Herbert Barker, Chicago, addressed the Montgomery County Medical Society, Dayton, February 21, on pneumonia.——Dr. Frederick A. Coller, Ann Arbor, Mich., addressed the Summit County Medical Society, February 4, on "Water Balance in Surgical Patients." Dr. Coller also addressed the Cleveland Academy of Medicine, February 21, on "Water Balance and Dehydration in the Sick Patient."

PENNSYLVANIA

County Secretary for Forty Years.—Dr. Anthony F. Myers, Blooming Glen, was guest of honor at a dinner at Doylestown, recently, celebrating his fiftieth anniversary in the practice of medicine. Dr. Myers, who is 80 years old, has been secretary of the Bucks County Medical Society for forty years, it is reported. Speakers at the dinner included Drs. Frank Lehman and James Frederic Wagner, Bristol; Henry I. Klopp, Allentown, and Edgar S. Buyers, Norristown. Dr. Harvey Doyle Webb, Bristol, presided.

Philadelphia

Personal.—Dr. Sigmund S. Greenbaum, associate professor of dermatology and syphilology, University of Pennsylvania Graduate School of Medicine, has been appointed professor in the department. Dr. Greenbaum, a graduate of Jefferson Medical College, is dermatologist at Mount Sinai Hospital.

Society News.—Drs. James P. O'Hare, Boston, and Dana W. Atchley, New York, addressed the Philadelphia County Medical Society, February 12, on chronic glomerular nephritis and on nephrosis. At a meeting February 19 speakers were Drs. Seth A. Brumm, on "Immunization Following Electrocoagulation of Tonsils"; Seymour DeWitt Ludlum, "Changes in the Globulin Picture Following Electrocoagulation of Tonsils"; Benjamin Ulanski, "A New Conservative Method of Treatment for Tic Douloureux"; Frederick D. Stubbs, "Phrenic Exeresis in Treatment of Pulmonary Tuberculosis," and James H. Mendel, "Eardrums and Their Interpretation," a display of plaster models showing progressive stages of ear infections and their treatment. Graduate seminars on gynecology were presented, February 14, by Dr. George A. Ulrich, on toxemias and February 21, by Dr. Philip F. Williams, on puerperal sepsis.——Speakers at a meeting of the Philadelphia Pediatric Society, February 11, were Drs. Mitchell I. Rubin and Milton Rapoport, on "Three Major Complications of Acute Nephritis," and Rachel Ash, "Statistical Study of Heart Cases at the Children's Hospital from 1925 to 1935."——Among speakers before the Philadelphia Academy of Surgery, February 12, were Drs. Thomas A. Shallow, on "Résumé of 500 Cases of Osteomyelitis," and Alexander Randall and Frederick A. Bothe, "Value of Preoperative Irradiation in Tumor Testis."

Pittsburgh

County Society Offers Courses.—The Allegheny County Medical Society has announced the tenth series of practical courses to begin the middle of March and run from four to six weeks each. The subjects will be neurology, recent advances in applied therapeutics, office gynecology, treatment of leg ulcers and the injection treatment of varicose veins, acute communicable diseases, common skin diseases and malignant conditions of the mucous membrane, practical obstetrics, anesthesia and gastro-enterology.

Society News.—Dr. Charles C. Higgins, Cleveland, addressed the Pittsburgh Urological Association, February 10, on "Further Experimental Observations on the Production and Solution of Urinary Calculi."——At a meeting of the Pittsburgh Ophthalmological Society, February 10, Dr. William L. Benedict, Rochester, Minn., read a paper on "Surgical Affections of the Orbit."——The annual R. W. Stewart Memorial Lecture of the Pittsburgh Academy of Medicine was given by Dr. Fred W. Rankin, Lexington, Ky., February 11, on "Evolution of Surgery of the Large Bowel and Rectum."

SOUTH CAROLINA

Bill Introduced.—S. 1176 proposes to repeal those provisions of the dental practice act requiring the annual registration of licentiates.

TEXAS

Dallas Clinical Conference.—The eighth annual spring conference of the Dallas Southern Clinical Society will be presented at the Baker Hotel, March 16-19. The program includes general assemblies each morning and graduate lectures, round table luncheon conferences, clinics each afternoon, special conferences Tuesday and Thursday afternoons, a public meeting Monday evening, symposiums Tuesday and Wednesday evenings, and a banquet for the final high light of the meeting. The following guest speakers will appear at the general assemblies and take part in other parts of the program:

Dr. Edgar G. Ballenger, Atlanta, Disorders of the Posterior Urethra.
Dr. Hans Barkan, San Francisco, Injuries to the Eye.
Dr. Francis G. Blake, New Haven, Conn., Treatment of Lobar Pneumonia.
Dr. Alan G. Brown, Toronto, Meeting the Nutritional Requirements of Infancy and Childhood.
Dr. Louis A. Buie, Rochester, Minn., Diagnostic and Therapeutic Methods in Anorectal Diseases.
Dr. William R. Cubbins, Chicago, Traumatic Injuries to the Knee Joint.
Dr. C. Frederic Fluhmann, San Francisco, Sex Hormones and Menstruation.
Dr. Verne C. Hunt, Los Angeles, Diagnosis of Breast Tumors.
Dr. Foster Kennedy, New York, Allergic Manifestations in the Nervous System.
Dr. Byrl R. Kirklin, Rochester, Minn., Diagnosis of Early Pulmonary Tuberculosis.
Dr. John A. Kolmer, Philadelphia, Susceptibility, Immunity and Vaccination in Infantile Paralysis.
Dr. Walter A. Wells, Washington, D. C., Hoarseness from the Standpoint of the Otolaryngologist.

At the public meeting Dr. Kennedy will speak on "Education of Children for Emotional Control" and Dr. Kolmer on "Vaccination Against Disease." In a symposium on diseases of the paranasal sinuses, speakers will be Drs. Barkan, Wells and Kolmer; in one on pelvic diseases, Drs. Fluhmann and Kennedy, and in one on acute pulmonary diseases, Drs. Blake, Brown and Kirklin.

VIRGINIA

University News.—Dr. Sydney W. Britton, professor of physiology, University of Virginia Department of Medicine, University, has received a grant of $15,000 from the Rockefeller Foundation to finance a three year program of research on the adrenal glands.

Bill Introduced.—H. 275 proposes to prohibit the distribution, except by a licensed physician or by a licentiate under the pharmacy practice act, of articles, devices, drugs or medical preparations manufactured primarily for, or which may be used as, contraceptives or for the prevention of venereal diseases or infections.

Personal.—Dr. Will R. Williams, Richlands, was appointed to the state board of health recently to succeed the late Dr. Joseph A. McGuire, Norton.——Dr. Linwood Farley has been made health officer of Hanover County with headquarters at Ashland.——Dr. Quintus H. Barney has been elected health officer of Altavista and community succeeding the late Dr. John Arnold Board. Dr. John W. Bowdoin, Bloxom, was recently appointed superintendent of public welfare for Accomac County.

WASHINGTON

Dinner to Dr. Clancy.—Friends and associates of Dr. Frank J. Clancy, Seattle, gave him a farewell dinner at the Rainier Club, January 27. Dr. Clancy, who has been executive chairman of the Public Health League of Washington, has been appointed director of the Bureau of Investigation of the American Medical Association, Chicago. Speakers included Drs. Nathan L. Thompson, Everett, Casper W. Sharples, Otis F. Lamson, Raymond L. Zech, Harrison, Garner Wright, Robert D. Forbes and George W. Swift.

Society News.—Drs. Bernard D. Harrington and Charles D. Hunter, Tacoma, addressed the Pierce County Medical Society, Tacoma, in December, on bone tumors and on dislocation of cervical vertebrae.——Dr. Richard B. Dillehunt, Portland, Ore., addressed the Walla Walla Valley Medical Society, Walla Walla, December 12, on pain in the lower back and sacro-iliac discomfort.——The King County Medical Society was addressed February 17 in Seattle by Drs. Martin Norgore on "Neuroma of the Appendix" and Charles F. Watts, "Coarction of the Aorta." Dr. Roscoe E. Mosiman conducted a pathologic demonstration; all are from Seattle.

WEST VIRGINIA

Personal.—Harry K. Gidley, formerly connected with the Kellogg Foundation of Michigan, has been placed in charge of the state WPA rural sanitation program, succeeding Dr. Frederick T. Foard, who was recently transferred by the U. S. Public Health Service to San Francisco, where he is regional consultant for the service in a territory embracing nine states, the *News Letter* of the state health department reports.

GENERAL

American Academy Offers Prize.—In compliance with the requirements of a gift under the will of the late Francis Amory, Beverly, Mass., the American Academy of Arts and Sciences announces the offer of a septennial prize to be known as the Francis Amory Septennial Prize. The gift provides a fund, the income of which may be awarded for conspicuously meritorious contributions to the field of knowledge "during the said septennial period next preceding any award thereof, through experiment, study or otherwise . . . in the diseases of the human sexual generative organs in general." The prize may be awarded to any person or persons for work of "extraordinary or exceptional merit" in this field. In case there is work of a quality to warrant it, the first award will be made in 1940. The total amount of the award will exceed $10,000 and may be given in one or more awards. It rests solely within the discretion of the academy whether an award shall be made at the end of any given seven year period and also whether it shall be awarded to more than one person. While there will be no formal nominations, and no formal essays or treatises will be required, the committee invites suggestions, which should be made to the Amory Fund Committee, care of the American Academy of Arts and Sciences, 28 Newbury Street, Boston.

Influenza Virus Desired for Study.—The International Health Division of the Rockefeller Foundation wishes to obtain strains of virus from different outbreaks of influenza in order to compare their immunologic characteristics in a study now in progress. Health authorities are urged to notify Dr. Johannes H. Bauer, Rockefeller Institute, York Avenue and Sixty-Sixth Street, New York, by collect telegram or fast mail of any epidemic of influenza, giving any particulars, such as the number of cases and clinical characteristics, that may be available. In an extensive outbreak it may be found advisable to send one of the division's investigators, but in smaller outbreaks the cooperation of the local health authorities is requested. On receipt of notice of an outbreak, containers already sterilized will be furnished with detailed instructions for the collection and shipment of the material. Blank forms for recording information will also be furnished. The material most desired is sputum and nasal mucus, throat washings obtained by having the patient gargle either with a bacteriologic broth or with ordinary physiologic solution of sodium chloride, and pieces of lung or bronchial mucus in case necropsy material is available. Also blood specimens taken from some of the patients during the early stage of attack as well as during convalescence will be appreciated. The study on influenza was carried on by the Rockefeller Institute at its hospital until January 1, when it was taken over by the International Health Division, to be continued in the division's laboratories at the institute.

American College of Physicians.—The twentieth annual session of the American College of Physicians will be held at the Book-Cadillac Hotel, Detroit, March 2-6. The mornings will be given over to clinics at various local hospitals, and the afternoons to the presentation of papers. Wednesday has been designated "Ann Arbor Day," with the staff of the department of medicine of the University of Michigan presenting the program. Clinics will be conducted in the morning. In the afternoon, papers will be read by the following:

Alexander G. Ruthven, LL.D., president of the University of Michigan, Address of Welcome.
Dr. Fred J. Hodges, Ann Arbor, The Medical and Economic Advantages of an X-Ray Chest Survey of All Hospital Admissions.
Dr. Frederick A. Coller, Ann Arbor, Clinical Aspects of Water Balance and Dehydration.
Dr. Carl D. Camp, Ann Arbor, Relation Between Emotion and Disturbance of Physiologic Function.
Dr. Cyrus C. Sturgis, Ann Arbor, Present Status of Pernicious Anemia. Experience with 600 Cases Over Eight Years.
Dr. Max M. Peet, Ann Arbor, Surgical Treatment of Hypertension.

The annual convocation will be held at the Book-Cadillac Hotel in Detroit Wednesday evening, when the John Phillips Memorial Medal will be presented. Dr. Walter B. Cannon, George Higginson professor of physiology, Harvard Medical School, Boston, will deliver the convocational oration on "The Rôle of Emotion in Disease," and Dr. James Alexander Miller, New York, the presidential address, entitled "The Changing Order in Medicine." The annual smoker will be held Monday evening. At the annual banquet Thursday evening, Dr. Henry R. Carstens, Detroit, will be the toastmaster and the speaker will be Jesse S. Reeves, Ph.D., W. W. Cook professor of American Institutions and chairman of the department of political science, University of Michigan. His address will be entitled "New Paths and Old Landmarks."

Medical Bills in Congress.—*Change in Status:* H. R. 11035, making appropriations for the military and nonmilitary activities of the War Department for the fiscal year ending June 30, 1937, has passed the House. The bill proposes an appropriation of $20,660 for the Library of the Surgeon General's Office to purchase books of reference, periodicals and technical supplies and equipment. For the preceding fiscal year, the appropriation for similar purposes was $15,700. The bill proposes no specific appropriation for printing the "Index Catalogue of the Army Medical Library." For the preceding fiscal year, the appropriation for this purpose was $37,000. The pending bill provides that none of the funds appropriated therein shall be available for any expense on account of any student in the air corps, medical corps, dental corps or veterinary units not a member of such units on May 5, 1932. *Bills Introduced:* S. 3984, introduced by Senator Byrnes, South Carolina, proposes to reenact all public laws in effect on March 19, 1933, granting pensions (1) to former members of the military and naval service for injury or disease incurred or aggravated in the line of duty in the military or naval service, other than war-time service, or (2) in the case of death from such injury or disease, to the widows and dependents of such members. S. 4000, introduced (by request) by Senator Copeland, New York, proposes to amend existing laws relating to the dissemination of information concerning the prevention of conception so as to make them inapplicable when such information, or when any article designed, adapted or intended solely for the prevention of conception, is sent, carried or conveyed (1) to any legally licensed practicing physician for the treatment of patients; (2) to any licensed druggist for the sole purpose of filling prescriptions of any such physician; (3) to any legally chartered medical college, for medical instruction at such college, or (4) to any legally licensed or chartered hospital or clinic, for the treatment of patients in such hospital or clinic. H. R. 11141, introduced (by request) by Representative Rankin, Mississippi, proposes that, notwithstanding any provision of law to the contrary, in no event shall Veterans' Administration facilities be used, on or after the date of enactment of the bill, to furnish medical and hospital care to persons not eligible to such care under the provisions of the laws providing relief for veterans. H. R. 11142, introduced (by request) by Representative Rankin, Mississippi, proposes to direct the Administrator of Veterans' Affairs to furnish to men discharged from the Army, Navy, Marine Corps or Coast Guard who are suffering from service-connected disabilities, who reside in foreign countries but are citizens of the United States, medical and hospital treatment for such diseases or injuries.

CORRECTION

Tests Used in Studying Hypertensive Disease.—In Queries and Minor Notes in THE JOURNAL, February 8, page 484, the standard formula employed in determining the blood urea clearance should have read

$$\text{Standard Blood Urea Clearance} = \frac{U}{B}\sqrt{V}$$

instead of with the 666 as printed.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 18, 1936.

Reforms in the School Medical Service

The board of education has issued to the local education authorities a circular indicating reforms of which a large proportion concern the school medical service. The local authorities are told that it is their duty not only to provide for the medical inspection of school children but also to make adequate arrangements for their health and physical condition. They should survey the needs of their areas and consider what further steps should be taken to remedy any deficiencies. The following criticisms are made:

THE SCHOOL DENTAL SERVICE

The school dental service is seriously incomplete in most parts of the country. Authorities should aim at an initial dental inspection of every child on its entry into school, to be followed by an annual reexamination. On this basis the board estimates that a minimum standard for a normal number of acceptances for treatment should consist of one dentist for every 5,000 children in an urban area and for every 4,000 in a rural area, although this is insufficient when a high proportion of parents accept treatment for their children.

ORTHOPEDIC TREATMENT

There should be in every area a scheme designed, in conjunction with an orthopedic hospital, to provide for the diagnosis, treatment and after-care of crippled children. Areas which have a scheme should consider the adequacy of the provision of places in orthopedic hospital schools for children who require long periods of treatment.

EAR DISEASES

In view of the need for expert treatment of ear diseases, which may result in deafness, authorities which have not yet done so should arrange for the services of part time aural specialists who would visit the areas periodically and advise as to treatment. The work of the specialists should be closely coordinated with that of the aural surgeons employed at the isolation hospitals, since many ear defects in children are due to acute infectious diseases.

OPEN AIR SCHOOLS

In many industrial districts open air schools do not exist or their number is inadequate. The board would welcome an increase in their number. While day schools suffice for most children, there are some who, on account of their debilitated condition or exceptional home circumstances, require the more continuous care that can be given only in a residential school. Where sufficient accommodation is not available, the existing voluntary agencies should be considered, and if these prove insufficient, the necessary residential schools should be established.

INSTITUTIONAL TREATMENT FOR ACUTE RHEUMATISM

Increased provision is needed for special institutional treatment of children suffering from or convalescent from acute rheumatism, because of the danger of heart disease. Though the number of cases is small, the problem is important. The method of cooperation with local voluntary agencies just mentioned might be followed.

SUBNORMAL CHILDREN

The subnormal child calls for careful attention. While additional day special schools for mentally defective children are not, as a rule, urgently required, there is need for increased residential provision for difficult children or those of low grade intelligence who are out of reach of or unsuitable for day special schools but cannot properly be retained in the ordinary public elementary school.

THE BLIND AND DEAF

The accommodation for blind and deaf children in the country is generally sufficient, but some additional provision for partially sighted and partially deaf children is desirable.

PHYSICAL EDUCATION

The board states that health can be maintained and improved only by systematic physical education. While organized games play an important part in this, the best means of securing continued physical fitness is by physical exercises in school premises or in the open air. Local authorities should frame comprehensive schemes of physical education. The board proposes to issue a circular dealing with the whole question, including the provision of physical education for young people who have left school. A centralized system of the continental type would not be appropriate, but organized local development is essential.

Voluntary Euthanasia

As previously stated, the proposal to legalize voluntary euthanasia has met with a good deal of criticism from the medical profession. A discussion took place at a meeting of the West Norfolk division of the British Medical Association, in which the legal profession also was represented. Dr. P. S. Marshall said that the bill tended to deprive the patient of hope, which was of vital importance in the worst cases. It introduced a disturbing element in the household of the patient and might lead to recriminations in the family afterward. The whole procedure would add much to the patient's distress and the physician's difficulties. From his experience he thought that only exceptionally few cases would come within the scope of the bill, while many patients who were a burden both to themselves and to the community were left out.

Mr. Coulton, a lawyer, said that the proposals cut right across the long established law of England and that public opinion was still much against suicide. As always there was a time lag between the proposed reform and the education of public opinion. There should be certain safeguards; the physician should not in any way benefit from the death of the patient and should be immune from subsequent action by the relatives.

In the discussion the majority of the speakers were against the proposal, chiefly on the ground that there was no call for it and because it excluded many people of the type mentioned by Dr. Marshall. On the legal side it was suggested that in nearly all cases of suicide the individual was insane and therefore no man in his senses would sign a document that he wished to take his life. But on the medical side this was not accepted, and it was averred that coroners' verdicts of "suicide while temporarily insane" were by no means strictly scientific.

Dr. C. K. Millard, honorary secretary of the Voluntary Euthanasia Legalization Society, dealt with the objections raised. The number of cases that might come under the bill was a matter of opinion, but this should not be a bar to its going forward. The measure was humane. No vote was taken on the bill.

Indian Women and Birth Control

The All-India women's conference at Trivandrum has passed a resolution affirming that there is need for instruction in birth control through recognized clinics and calling on the constituencies to make special efforts to induce municipalities and other organizations interested to open centers to give such instruction to all needing it. The resolution was carried by 80 votes to 25. Though it repeats the one of last year, its passing in Travancore, where birth control has many opponents, is regarded as significant.

Tuberculous Nurses

Tuberculosis is especially fatal to young women and frequently attacks nurses. The directors of the Papworth Village Settlement for Tuberculosis, the pioneer institution of this kind, which has been copied all over the world, have produced a scheme for dealing with the problem. In a letter appealing for funds, published in the *Times*, they point out that after sanatorium treatment the tuberculous nurse is faced, like other sufferers, with the necessity of earning her living, but with the difference that her profession often leads her into sick-rooms. If she confesses that she is tuberculous, she destroys her chance of employment. If she conceals the fact, she may come into contact with persons whose lowered resistance makes them susceptible to infection. Recognizing this and conscious of the menace to public health, Papworth has decided to offer a third choice, of great value to these unfortunate nurses and to the community. It proposes to build a special home for tuberculous nurses who come there for treatment and, when active treatment is concluded, to employ them in the exercise of their profession or in other suitable employment under the special conditions which their health requires. These nurses will thus be rendered as nearly as possible self supporting and the community will be protected against infection. At present applications for employment are frequently made to Papworth by tuberculous nurses, some of whom have received sanatorium treatment but cannot afterward obtain suitable employment.

PARIS

(From Our Regular Correspondent)

Jan. 10, 1936.

The Lack of Sanitation in France

In the *Concours médical*, Dr. J. Noir emphasizes the shirking of their duty by the authorities in the matter of sanitation, public hygiene and simple cleanliness. For more than fifty years, public education has been compulsory in France, and hygiene is given a prominent place in every school. But the people remain about as ignorant in hygiene and sanitation as in past centuries. An example would have to be given by the administrations, which in France are under government control. Consider the buildings in the prefecture of the Seine or in any bureau in France: They sometimes are dilapidated and too often nobody worries about cleanliness; the result is awful. In a lot of government buildings, for instance, the duty of cleaning the windows is entrusted to two different departments: the outside to some ministry, the inside to the local authority. The result is that when one side is clean the other is dirty.

The ministry of public health, about which the hygienists indulged in beautiful dreams, is a portfolio to be given to some politician, who will be superseded by another one, equally inadequate, when he begins to learn something about his job. Only one of the ministers of public health has been a physician or some other competent person since the creation of this ministry.

Dr. Georges Schreiber, in the bulletin of the Parti social de la santé publique, points out that the public health law of 1902 is without virtue, because the mayors who are in charge of it do not worry about it. In Paris, where the police should take more pains to enforcing the law, nobody cares; the simpler regulations, such as forbidding the exposure of eatable goods to dust, and the obligation to wrap bread and fruit, are neglected. The food may be pawed over by anybody, and the flies may help themselves first; anybody may spit on the ground. The police never arrest any one or, if they do, the intervention of some alderman releases the offender.

Some departments, directly under the control of authorities and managed by technicians, are better: for instance, the inspection of meat or milk, in the slaughterhouses or dairies. In some cases, private initiative has succeeded in bettering the conditions of a whole sanitary department; the Touring Club, for instance, exerts good control over the country hotels, and the automobile associations have made tolerable the policing of the roads. But, on the whole, one can hardly hope for a great advance in general sanitation in France except by the education of the public, which is a long and hard task.

The Prevention of Hereditary Syphilis

In the *Concours médical*, Professor Gougerot defines the general rules of the prevention of hereditary syphilis. This disease is in France more than a disease: it is a national peril; and France cannot afford to lose human capital, by death, unfitness or lunacy, conditions that are the future of the syphilitic stock. According to Professor Gougerot, the first step is to avoid procreation before complete recovery from syphilis.

The recognized conditions of a cure, in France, are as follows:

A period of two or three years after the chancre, if the treatment is begun early, and four or five years if treatment is initiated a fortnight after the chancre. Regular treatment during this period, with compounds of arsenic, bismuth and mercury.

Absence of any lesion during at least two years.

Normal character of the disease; i. e., exclusion of the arsenic resistant or bismuth by resistant cases.

Negative blood test made by the most sensitive methods, such as the Harrison-Wyler or Sorelli-Miravent, or the flocculation method, Kahn's type.

Negative spinal fluid test.

Another means of security, the second one, is to have the two apparently cured prospective parents treated for two or three months before the wedding.

A third means is to treat always the future mother during her pregnancy. But here the opinions differ. Some physicians advise treatment in every case, even if the preventive standards have been satisfied; Professor Gougerot limits the treatment of formerly syphilitic and actually pregnant women to the cases in which clinical or serologic activity is present in one of the parents or both or in whom the blood test was positive less than two years before; when the previous pregnancies were unsuccessful; when some of the first children were deficient or unsound, and when the parents show some transmissible taints.

The Blood Sugar in Hypertension

In the *Progrès médical*, Drs. G. Carriére and Claude Huriez discuss dextrose metabolism in hypertension. They studied 105 cases in which there was a permanent high blood pressure above 200. The blood sugar in fasting showed a slight increase in ninety-four cases of hypertension and a decrease in eight cases. As to the frequency of permanent high blood pressure in diabetes, the authors think that it could be figured between 14 and 30 per cent; but it never occurs in juvenile diabetes. The older a diabetic patient is, the more he is liable to get hypertension as a result of arteriosclerosis.

The Treatment of Scoliosis

The ankylosing graft operation seems to have been initiated by Professor Ombredanne, who at any rate applied it in forty cases, presented before the Société de pédiatrie of Paris. General preparation of the patient, who is often underweight, is necessary. Such preparatory nursing reduces the mortality from intervention. As for the operation, one can use different technics: the Albee operation, which is often impossible because of the curve of the vertebrae; the Hibbs operation, which is long and complex; the Halstead operation, and Professor Ombredanne's technic, which consists in taking a graft from the tiba. The graft is kept sterile and the tibial section is closed. The patient lies on the bed, flat on the face. The bone graft is inserted between the posterior and the anterior part of the vertebral processes. The main complication is shock, which killed three of Professor Ombredanne's patients (two more are dead of septicemia). One can reduce the incidence of the

shock with preoperative care and by performing the operation in two or three stages. The skill of the surgeon is of great moment in shortening the duration of the operation. The results are satisfying. While the graft maintains well enough the rigidity, in four cases the deformity was aggravated.

Bercovitz's Method for Early Diagnosis of Pregnancy

Bercovitz in 1930 proposed a simple method for the early diagnosis of pregnancy, consisting of dropping in the corner of one of the patient's eyes a few drops of her own serum or of her own blood with an admixture of sodium citrate. Two minutes later, according to the time of day, the amount of illumination and the former condition of the pupil, a partial myosis or mydriasis of the treated eye appears, which is easily ascertainable by comparing with the other eye. This reaction was averred to be positive in 84.7 per cent of the cases observed. In the Société d'obstétrique et de gynécologie of Paris, Dr. L. Pouliot introduced some minor changes in Bercovitz's technic. He found it convenient to look first at both eyes with a mild illumination and then suddenly to throw a bright light on the eyes. Pouliot tried the Bercovitz test on forty-four women. Every woman with a positive test was found to be pregnant. In two cases the early diagnosis was important because of an extra-uterine pregnancy. These diagnoses were all made before any clinical evidence of pregnancy, or even any suspicion, for instance after only eight days of delay of the menses. Pouliot concludes that: 1. A clear-cut positive reaction certainly indicates pregnancy. 2. One must consider as positive only myosis of the treated eye; pupillary changes leave room for doubt. 3. Negative reactions, without any clinical symptom of pregnancy, have very slight value, at least till the suppression of a second menstrual period. If the test is negative, and the pregnancy on the other hand is clinically probable, one must allow for the possibility of a retained dead ovum.

BERLIN

(From Our Regular Correspondent)

Dec. 26, 1935.

Bureau to Combat Violation of Antinarcotic Laws

For the purpose of waging a more efficient struggle against the illicit traffic in narcotics, the ministry of the interior has established, with immediately gratifying results, a "government central headquarters for combating offenses against the antinarcotic laws." This bureau functions in conjunction with the previously existing antinarcotic activities of the Prussian crime detection bureau in Berlin. At the same time branches of the central bureau have been set up throughout Germany. Local authorities must report to these coordinating bureaus all cases of more than a local significance. This must be done immediately if there is reason to suspect a criminal trade the ramifications of which are more than local and which is engaged in by professional criminals.

Suspects are also reported whose extensive journeying or foreign contacts might connect them with the sale and procuration of narcotics. Furthermore, pharmacy burglars, recidivist thieves and swindlers are reported to the bureau. As for drug addicts whose defective responsibility exempts them from criminal prosecution, their commitment to a hospital is effected. All cases involving administration of health regulations are reported to the ministry of health, the cooperation of which is assured. Furthermore, the government central bureau is provided with a card index of known criminals.

Crime-Commissioner Thomas, writing on the narcotic question in the *Zeitschrift für Polizeibeamte,* states that the number of drug addicts is difficult to determine but that the proportion is scarcely greater than one to each 10,000 inhabitants. When, however, the number was last computed in Germany (1928) there were estimated to be between 6,000 and 8,000 chronic opium addicts in the country. Meanwhile the still incomplete card index of the central bureau lists more than 1,000 who have been held subject to criminal prosecution. These figures show cause enough why the antinarcotic campaign should receive the vigorous attention of the authorities. While in the past it was customary for addicts considered mentally irresponsible to be released as immune from prosecution, the National Socialist government has taken measures to protect the general public against law breakers of this type. It is now possible in case of manifest irresponsibility to commit the offender for an indefinite period of time to an institution wherein he will receive proper treatment.

Group Examinations for Cancer

The Königsberg gynecologist Professor von Mikulicz-Radecki points out in *Der öffentliche Gesundheitsdienst* that according to careful estimates cancer is present in about a quarter of a million people in Germany (about one in every 240) and of these one fourth are under the age of 40. A majority of those afflicted with cancer still succumb to this disease. An organized anticancer campaign must be based on early diagnosis and must have as its aim the detection of the cancerous condition at such an early stage that favorable prognosis may be indicated in 80 per cent of the cases. Every citizen ought to be acquainted with the nature of cancer, and every physician should be in a position to recognize cancer in its earliest manifestations. A most efficient measure in the fight against cancer may be the systematic group examination of all healthy persons who have arrived at an age when a greater danger of cancer exists. In East Prussia, the capital of which province is Königsberg, this idea was attempted in 1933. No striking success was realized at that time, however, as the women would not come in voluntarily for examination. Thereupon the bureau of people's health of the National Socialist party in cooperation with the East Prussian administrative board inaugurated a large scale anticancer offensive. In 1936, group examinations will be undertaken not only in all the hospitals in the city of Königsberg but throughout the province as well. The examinations have already disclosed a whole series of cancerous conditions of which the persons themselves had no presentiment and which involved the mammary glands as well as the genitals. In the meantime the activity of the examining clinics had been discussed among the population with the result that the women now began to come voluntarily to be examined. This goes to show that cancer fear need not be produced by such measures as these.

Regulation of Blood Stream Resistance in the Lungs

The Breslau physiologist Professor Wagner recently pointed out the important factors that influence the pulmonary circulation, such as resistance changes in the pulmonary capillaries, transmission of the intrathoracic pressure, and changes in the beat volume due to changes in the blood supply. Of especial importance is the alteration in the course of ventricular pressure during inflation of the lung and its relation to the expulsion period of the right ventricle. From prolonged inflation the values of the maximum systolic pressure in the right ventricle are finally decreased because the amount of blood supplying the right ventricle must decrease below its outgoing volume. It is thus shown that the position of the thorax is of importance for the function of the right ventricle. If, during inflation, the thorax finds itself for some time nearer the expiratory position, the right ventricle is able to shut off the blood through the lungs with less exertion than if the thorax were near an inspiratory position. Considering the action of the reserve capillaries, it is to be expected that an increased pulmonary inflation would lead to a greater blood perfusion of reserve capillaries so that with an increased inflation the blood stream in the lungs is spread over a greater surface. Since only the surface of the blood stream comes into consideration as a gas exchange surface, apparently it may be possible for the organism to control the

respiratorily active blood surface according to the degree of pulmonary inflation. The reflex apparatus, first described in its effect by W. R. Hess of Zurich, which provides for a tonic adjustment of the respiratory musculature, particularly the diaphragm, is important in the adaptation of the respiratorily active surface of the blood stream within the lungs. This apparatus, which gives the respiratory muscles tonicity, apparently effects a correlation between minute volume in the pulmonary circulation and respiratory exchange of gases. The tonic component, which is determined by the extent of the deepest expiratory position, probably serves chiefly the adjustment of the active respiratory surfaces of the blood stream, whereas the respiratory movements chiefly supply the air exchange for the tonicized fixed respiratorily active blood surface and, as it were, breathe on it. The respiratory movement takes place in such a way that at no time will there be a reduction of the tonicized fixed minimal surface of the blood stream, which is determined by the expiratory position. One concludes that the respiratory center has a double purpose. Its rhythmic fluctuations of irritability serve the air exchange, while its tonic control probably serves principally the regulation of the respiratorily active surfaces of the blood stream within the lungs.

Group Roentgen Examinations in Combating Tuberculosis

Group roentgen examinations for the determination of tuberculosis have been undertaken for some time now. Particularly in Switzerland have noteworthy results been reported. Recently Dr. Misgeld made a report to the Berlin Medical Association on experimentation in this field. When one realizes that today the number of actively tuberculous persons in Germany amounts to from 300,000 to 400,000, together with a million threatened with the disease, one can scarcely overestimate the importance of a defensive campaign against this plague. Roentgenologic control is in particular requisite to the arrest of latent tuberculosis. How often potentially infectious tuberculosis can run a course nearly free from subjective symptoms is demonstrated by the result of a group roentgen examination of some 850 men, members of a special formation unit of the schutzstaffel of the National Socialist party. Again and again cases of active tuberculosis were discovered. It is therefore indicated that compulsory roentgen examinations should be instituted at least wherever people are brought together in great communities.

ITALY

(From Our Regular Correspondent)

Dec. 22, 1935.

The Annual Congress of Internal Medicine

The forty-first National Congress of Internal Medicine was held this year at Bologna (the meeting place of all medical congresses) with Senator Prof. Giacinto Viola presiding. In the opening address the esteemed Senator Prof. Edoardo Maragliano pointed out that the method followed by the society for the last half century is that of collective critical evaluation. Up to the present, 120 different topics have been dealt with in this manner. The dominant principle is the study of the patient; all clinics are biologic but concerned solely with that part of biology which is applicable to the understanding of the patient. Many clinical schools of Italy cooperate with the main school in keeping the society active and alive and for some years now the medical corps of the army has participated in the work of the society. He stated that, as the result of collaboration with the society of surgery, several specialties have been developed, such as hematology and legal medicine, two recently added. But internal medicine and surgery must remain the directing and unifying centers of all the specialties. After analysis comes synthesis, increasingly important at present in view of recent discoveries which show pathologic conditions as resulting not from the disease of a single organ but from anatomic and functional correlations between various organs.

The first subject, "Evaluation of the Individual Constitution," was divided into four parts: (1) "The Present Situation of the Scientific Movement with Regard to Individual Constitutions," by Dr. Benedetti; (2) "My Method of Evaluation of the Individual Constitution," by Dr. Viola; (3) "Growth from Ages of 11 to 17 and the Measurements That Assist in the Evaluation of the Individual Constitution According to the Viola Method," by Dr. Schiassi; (4) "The Psychologic Evaluation of the Individual Constitution," by Dr. Capone.

Dr. Benedetti stated that, differing in this respect from others, the Italian school understands by individual constitution the total of all the characteristics, somatic, functional, organic and psychologic, that differentiate one person from another. This school considers the sole object of its research to be the evaluation of the person in his complexity (phenotype), as a variant from the anatomic functional level of the species, modified by environment and the laws of heredity. The study of the person is arrived at only by means of lengthy approach in which figure the anatomy, physiology and pathology of the average type of our species; thus many factors are involved, such as the constitution according to race, ethnic group, sex, age and social station. The speaker reviewed recent foreign and Italian scientific contributions to the argument, making clear the differences between the foreign schools and the Italian school, which is based on the thought of De Giovanni, Viola, Castellino and Pende. The science of the individual constitution is new and as such leaves much to be accomplished.

Dr. Viola stated that, since the constitutional variability of characteristics is quantitative, the only method of research applicable to constitutional science is anthropometry, whether external or internal, functional, organic or psychologic. Anthropometric research is not limited to the measurement of the individual variants of each character but takes into account their evaluation according to the norm of individual statistics. The individual variations of characteristics and their combinations are infinite, but all are subject to the law of accidental errors of Quètelet, which finds its graphic expression in the curve of Gans, characteristically bell-like in form. Viola's objective method of evaluation gives a double conception of the evaluation of each human characteristic in centesimal and sigmatic degrees and has for its unique object of study the average man considered as a systematic unit derived from a synthesis of normal values of all the characteristics considered. The existence of this average man, demonstrated by Viola during the last thirty years, is confirmed by new observations. Viola's external anthropometric method is based on ten simple fundamental measurements (closed system) from which are obtained, by simple calculations, a series of relationships that become gradually more complex as their elaboration proceeds. The second phase of Viola's method is concerned with the evaluation of functional individuality, which is based on the direct quantitative determination of a number of organic functions, on the study of interfunctional relationships and on the elaboration of certain synthetic indexes, which become gradually more complex until the formation of the general index of organic power. The important synthetic indexes have to do with the perimetral average of the limbs, the dynamometric average, the cardiac value and the indexes of cardiac power. A series of relationships (spirosomatic, spirothoracic, spirocardiac) are drawn from these indexes. From these first synthetic evaluations he goes to more comprehensive evaluations represented by the static index and the dynamic index of organic power, whence he derives as a synthesis of the third order the general index of organic power. In such a way the individual is evaluated on the basis of a uniform system, founded on mathematics, which resolves the problems that beset the practicing physician when he attempts to characterize people as robust, average or delicate.

Dr. Schiassi set forth the results of a study of that period of growth during which sexual maturity takes place. The groups studied consisted of males and females varying in number between fifty and a hundred. The result of many measurements shows that the most intensive development takes place in female subjects aged from 12 to 14 and in male subjects aged from 13 to 15. At the age of 10 the measurements of male subjects are nearly equal to those of female subjects; from 12 to 14, the curve of the female subjects runs above that of the males throughout the greater part of linear and cubic measurements. This growth coincides with, or slightly precedes, the definite manifestation of sexual maturity; in fact, from 20 to 25 per cent of Bolognese girls first menstruate at the age of 13, and 98 per cent of these girls are menstruating at the age of 15.

Dr. Capone, in the study of psychologic evaluation of the individual constitution, distinguishes a cortical or superior personality and also an instinctive or fundamental personality. He finds that, as the values of the superior personality and of the affective personality are raised, the percental number of longitypes is increased. The number of extroverts (in the precise sense of Jung) increases. With the rise of the affective personality, the percental number of tachypsychic persons increases.

The second paper, on the diagnosis of icterus, was by Senator Prof. Ferdinando Micheli of Turin, assisted by Drs. Dominici and Allodi. Dr. Micheli said that icterus is a symptom rather than a syndrome. When in addition to the yellow color there are such other symptoms as pruritus, bradycardia or hemorrhage, these are no longer attributed to certain constituents of bile, as was formerly done. The diagnosis is difficult and sometimes extremely serious. In each case in which the diagnosis of icterus does not appear obvious, one should proceed to classify the icterus as belonging to one of four groups: mechanical, hepatogenous, hemolytic or prehepatic, and hepatic-cholangeitic. The second phase of the diagnosis consists of subclassification of the individual case into further categories. The ease with which this may be accomplished depends on the thoroughness of the examination.

D'Amato illustrated his studies on the chemical changes in bile following hepatic, chemical and bacterial intoxication. He believes that when icterus is not present the changes may be in the hepatic cell; when icterus is present, cellular disturbance and changes in the biliary capillaries are manifest.

For the next congress the following subjects were chosen: (1) cardiac decompensation (Dr. Cesa-Bianchi), (2) lipodystrophy and constitutional emaciation (Dr. Galli) and (3) sellar tumors (in conjunction with the society of surgery).

Marriages

WALTER W. BROWN, Williford, Ark., to Miss Margaret McLeod of Sault Ste. Marie, Mich., recently.

JOHN EDWIN BROWN JR., Columbus, Ohio, to Miss Rosamond Lawson Foote of Baltimore, Dec. 28, 1935.

WALTER GRADY BISHOP, Greenwood, S. C., to Miss Martha Thurmond of Spartanburg in January.

JOHN GORDON BELL, Covington, Va., to Miss Anna Lee Paschall of Richmond, Nov. 30, 1935.

RICHARD LAWRENCE DAY, Ridgewood, N. J., to Miss Ida Elizabeth Holt of Summit, January 10.

RODOLPH FOWLKES, Welch, W. Va., to Miss Rinda Elizabeth Gay of Chatham, Va., Dec. 11, 1935.

GEORGE LOUIS JONES, Ridgeway, Va., to Miss Ruth Margaret Wilson of Richmond, Dec. 14, 1935.

ANGUS HINSON, New York, to Miss Johnie Lea Black of Chase City, Va., Oct. 19, 1935.

BERNARD H. BAYER, Houston, Texas, to Miss Rebecca Miller of New Orleans recently.

Deaths

Rea Everett Smith ✠ Los Angeles; University of Pennsylvania Department of Medicine, Philadelphia, 1902; member of the American Surgical Association; member and past president of the Pacific Coast Surgical Association; fellow of the American College of Surgeons; clinical professor of surgery, University of Southern California School of Medicine; formerly professor of clinical surgery, College of Medical Evangelists; served during the World War; on the staffs of the Los Angeles General Hospital, Good Samaritan Hospital, Methodist Hospital and the Cedars of Lebanon Hospital; aged 59; died suddenly, Nov. 29, 1935, of coronary thrombosis while aboard a yacht.

Parran Jarboe, Greensboro, N. C.; Georgetown University School of Medicine, Washington, D. C., 1905; member of the Medical Society of the State of North Carolina; fellow of the American College of Surgeons; formerly secretary of the Guilford County Medical Society; on the staffs of St. Leo's Hospital, L. Richardson Memorial Hospital, Sternberger Children's Hospital, Wesley Long Hospital and the Glenwood Park Sanitarium; aged 53; died, Dec. 29, 1935, in a hospital at Shelby, of injuries received in an automobile accident.

William Oliver Floyd ✠ Nashville, Tenn.; University of Nashville Medical Department, 1910; served during the World War; member of the Southern Surgical Association; fellow of the American College of Surgeons; assistant in clinical surgery, Vanderbilt University School of Medicine since 1925; member of the surgical staffs of the Vanderbilt, St. Thomas, Nashville General and City hospitals; aged 56; died, January 12, of pneumonia.

Roy Seymour Watson ✠ Saginaw, Mich.; Rush Medical College, Chicago, 1904; member of the American Academy of Ophthalmology and Oto-Laryngology; fellow of the American College of Surgeons; served during the World War; chief of otolaryngology, Saginaw General Hospital; aged 53; died, Nov. 27, 1935, of chronic myocarditis.

Franklin Elmore Ray, Shelbyville, Ind.; Medical College of Indiana, Indianapolis, 1890; member of the Indiana State Medical Association; at one time county coroner and member of the county board of health; aged 70; on the staff of the Major Memorial Hospital, where he died, Dec. 18, 1935, of septicemia due to an injury to a finger.

Millington Smith ✠ Oklahoma City; Missouri Medical College, St. Louis, 1881; professor of gynecology, emeritus, University of Oklahoma School of Medicine; fellow of the American College of Surgeons; medical director of the Mid Continent Life Insurance Company; aged 75; consulting surgeon to University Hospital and St. Anthony's, where he died, January 9, of carcinomatosis.

James Edward Davis ✠ McAlester, Okla.; Hospital College of Medicine, Louisville, Ky., 1904; past president of the Pittsburg County Medical Society; on the staffs of the Albert Pike Hospital and St. Mary's Infirmary; aged 56; died, Dec. 20, 1935, in the A. C. H. Hospital, Shawnee, of injuries received in an automobile accident.

Emil Otto Krueger ✠ Michigan City, Ind.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1908; past president of the La Porte County Medical Society; on the staffs of the Clinic Hospital and St. Anthony's Hospital; aged 50; died, Dec. 22, 1935, of abdominal abscess and organic heart disease.

Dennett B. Hamilton, Dodgeville, Wis.; Wisconsin College of Physicians and Surgeons, Milwaukee, 1899; member of the State Medical Society of Wisconsin; on the staffs of the Dodgeville General Hospital and St. Joseph's Hospital; aged 59; died, Dec. 20, 1935, of intestinal obstruction due to postoperative adhesions.

Francis Xavier Mahoney, Boston; Harvard University Medical School, Boston, 1905; member of the Massachusetts Medical Society; health commissioner of Boston; formerly chairman of the city board of health; aged 65; died, January 14, in the Deaconess Hospital, of carcinoma of the liver and pancreas.

Hubert Livingstone Miller ✠ Captain, U. S. Army, retired, Seattle; University of Pennsylvania Department of Medicine, Philadelphia, 1905; served during the World War; entered the medical corps of the U. S. Army in 1920 as a captain and retired in 1923 for disability in line of duty; aged 53; died, Dec. 7, 1935.

Edgar F. Fincher Sr., Atlanta, Ga.; Atlanta College of Physicians and Surgeons, 1901; member of the Medical Association of Georgia; on the staff of the Piedmont Hospital; for

many years member of the board of trustees of the Grady Hospital; aged 66; died, January 7, of coronary sclerosis.

William James McCollum, Toronto, Ont., Canada; Victoria University Medical Department, Coburg, 1894; formerly associate in medicine and clinical medicine, University of Toronto Faculty of Medicine; for many years on the staff of St. Michael's Hospital; aged 63; died, Dec. 24, 1935.

Daniel Henry Cunningham, Chicago; Jefferson Medical College of Philadelphia, 1893; instructor in medicine, College of Physicians and Surgeons, 1903-1907; on the staff of the Hospital of St. Anthony de Padua, 1905-1914; aged 71; died, Dec. 28, 1935, of chronic nephritis and hypertension.

Dana Elbra Monroe ✠ Cameron, Texas; Johns Hopkins University School of Medicine, Baltimore, 1910; past president and secretary of the Milam County Medical Society; served during the World War; on the staff of the Cameron Hospital; aged 51; died, Nov. 25, 1935, of septicemia.

Homer Tomlinson Partree ✠ Torrington, Conn.; Yale University School of Medicine, New Haven, 1892; formerly medical inspector for the schools and health officer of Eatontown, N. J.; on the staff of the Charlotte Hungerford Hospital; aged 70; died, Dec. 9, 1935, of pneumonia.

Rufus Herbert Carver ✠ Providence, R. I.; Harvard University Medical School, Boston, 1870; on the consulting staff of the Providence Lying-In Hospital and on the courtesy staff of the Rhode Island Hospital; aged 86; died, Dec. 30, 1935, of hypostatic pneumonia.

Edwin Harper Linfield, Alexandria, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1920; on the staff of the Veterans Administration Facility; aged 39; died, Dec. 28, 1935, in Jonesville, of injuries received in an automobile accident.

George Earl Low, Grants Pass, Ore.; Willamette University Medical Department, Salem, 1912; served during the World War; aged 50; died, Dec. 9, 1935, in the Veterans Administration Facility, Portland, of carcinoma of the stomach with metastases.

Irwin Zepp Kinsey, Souderton, Pa.; Jefferson Medical College of Philadelphia, 1926; member of the Medical Society of the State of Pennsylvania; on the staff of the Grand View Hospital, Sellersville; aged 46; died, Dec. 8, 1935, of heart disease.

George Francis Sullivan ✠ Hoboken, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1907; aged 50; on the staff of St. Mary's Hospital, where he died, Dec. 23, 1935, of coronary thrombosis and arteriosclerosis.

William Irvin Messick, Baltimore; University of Maryland School of Medicine, Baltimore, 1895; formerly associate professor of clinical medicine at his alma mater; aged 66; died, January 3, in the University Hospital, of diabetes mellitus.

Jacob Wells Meighen, Ulen, Minn.; University of Minnesota Medical School, Minneapolis, 1896; formerly on the staff of St. Ansgars Hospital, Moorhead; aged 72; died, Dec. 9, 1935, in Minneapolis, of pneumonia and cerebral hemorrhage.

Charles Abel Howland, Schenectady, N. Y.; Baltimore Medical College, 1908; member of the Massachusetts Medical Society; served during the World War; aged 58; died, Dec. 28, 1935, of coronary thrombosis and arteriosclerosis.

Thomas Nelson Schnetz, Milwaukee; Rush Medical College, Chicago, 1884; formerly associate professor of physiology, Milwaukee Medical College; aged 75; died, Dec. 17, 1935, of carcinoma of the prostate and bronchopneumonia.

George H. Herring, Slocomb, Ala.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1898; member of the Medical Association of the State of Alabama; aged 58; died in December 1935, of pneumonia.

Carl Ludwig Knitter Jr., Chincoteague, Va.; Hahnemann Medical College and Hospital of Philadelphia, 1928; aged 35; died, Dec. 25, 1935, at the Johns Hopkins Hospital, Baltimore, of pneumonia and brain tumor.

Frederick Smith Clark, Columbus, Ohio; Ohio Medical University, Columbus, 1907; member of the Ohio State Medical Association; aged 59; died, Dec. 9, 1935, in the White Cross Hospital, of heart disease.

Westley W. Halliburton, Alton, Ill.; Missouri Medical College, St. Louis, 1878; member of the Illinois State Medical Society; aged 84; died, Dec. 28, 1935, in St. Joseph's Hospital, of cerebral hemorrhage.

William P. Parrish, Chatham, Va.; Baltimore Medical College, 1891; member of the Medical Society of Virginia; formerly mayor of Chatham; aged 69; died, Dec. 6, 1935, of arteriosclerosis and hypertension.

Solomon Crittenden Jones, Baileys Switch, Ky.; University of Louisville Medical Department, 1898; member of the Kentucky State Medical Association; aged 66; died, Dec. 25, 1935, of heart disease.

Joseph H. Schnell, Houston, Texas; University of Pennsylvania Department of Medicine, Philadelphia, 1872; aged 85; died, Dec. 13, 1935, of cerebral hemorrhage, chronic nephritis and arteriosclerosis.

Charles Sledge Coker, Crosby, Texas; Dallas Medical College, 1904; aged 76; died, Dec. 19, 1935, in the Memorial Hospital, Houston, of hypertensive heart disease, nephritis and bronchopneumonia.

Harvey Whiting Humphrey, Lowville, N. Y.; New York University Medical College, 1897; member of the Medical Society of the State of New York; aged 64; died, Dec. 21, 1935, of myocarditis.

Luther Green Probasco, Whitesville, N. Y.; Baltimore Medical College, 1898; member of the Medical Society of the State of New York; aged 63; died, Dec. 24, 1935, of chronic myocarditis.

Joseph J. Clark, Tishomingo, Okla.; University of Louisville (Ky.) Medical Department, 1896; formerly member of the state legislature; aged 60; died suddenly, Dec. 10, 1935, of heart disease.

Henry B. Pack, Blacksburg, Va.; College of Physicians and Surgeons, Baltimore, 1905; aged 57; died, Dec. 2, 1935, in the New Altamont Hospital, Christiansburg, of coronary thrombosis.

Alfred C. Heritage, Jenkintown, Pa.; Hahnemann Medical College of Philadelphia, 1884; aged 77; died, Dec. 11, 1935, at his winter home in St. Petersburg, Fla., of bronchopneumonia.

David Cummings McLaren, Ottawa, Ont., Canada; McGill University Faculty of Medicine, Montreal, Que., 1880; Hahnemann Medical College of Philadelphia, 1881; died, Dec. 30, 1935.

Alfred William Christopherson, Pendleton, Ore.; University of Oregon Medical School, Portland, 1928; member of the Oregon State Medical Society; aged 34; died, Dec. 3, 1935.

George Francis May, London, England; McGill University Faculty of Medicine, Montreal, Que., Canada, 1895; served during the World War; died suddenly, Oct. 16, 1935.

George B. M. Bower, Fort Wayne, Ind.; University of Maryland School of Medicine, Baltimore, 1887; aged 73; died, Dec. 28, 1935, of uremia and prostatic obstruction.

John Fletcher Massey ✠ Ventnor, N. J.; Tennessee Medical College, Knoxville, 1903; served during the World War; aged 63; died, Dec. 21, 1935, of angina pectoris.

William Compton Harris, Houston, Texas; St. Louis College of Physicians and Surgeons, 1891; aged 65; died, Dec. 13, 1935, of chronic myocarditis and hypertension.

George White, Chicago; Kentucky School of Medicine, Louisville, 1881; aged 80; died, Dec. 17, 1935, in the Roseland Community Hospital, of cerebral hemorrhage.

L. K. Swango, Carlisle, Ky.; Louisville Medical College, 1891; member of the Kentucky State Medical Association; aged 68; died, Dec. 12, 1935, of heart disease.

Thomas Warren Knight, Portage, Ohio; Hahnemann Medical College and Hospital, Chicago, 1893; aged 80; died, Dec. 4, 1935, of hypostatic pneumonia.

Lewis Scott Harvey, Council Grove, Kan.; University Medical College of Kansas City, Mo., 1901; aged 56; died, Dec. 16, 1935, of cerebral hemorrhage.

John K. Knorr, Ventnor, N. J.; Jefferson Medical College of Philadelphia, 1867; aged 89; died, Dec. 25, 1935, of chronic myocarditis and arteriosclerosis.

Elbert Ernest Cone, Oxford, Neb.; Eclectic Medical Institute, Cincinnati, 1892; aged 69; died, Dec. 31, 1935, of myocarditis and bronchopneumonia.

Edward E. G. Weiland, Bloomington, Ill. (licensed in Illinois in 1895); aged 67; died, Dec. 14, 1935, as the result of injuries received in a fall.

Alonzo Richard Hodge, Severn, N. C.; Medical College of Virginia, Richmond, 1925; aged 35; died, Dec. 12, 1935, of pneumonia and influenza.

Joseph H. Miller, Fremont, Neb.; Omaha Medical College, 1888; aged 75; died, Dec. 11, 1935, in the Clarkson Hospital, Omaha, of peritonitis.

John Joseph McLaughlin, Chicago; Long Island College Hospital, Brooklyn, 1879; aged 77; died, Dec. 30, 1935, of myocarditis.

Correspondence

"USE OF UNSATURATED FATTY ACIDS IN TREATMENT OF ECZEMA"

To the Editor:—In The Journal, January 4, page 64, Dr. J. F. McClendon replied to our article on "The Use of Unsaturated Fatty Acids in the Treatment of Eczema" (The Journal, Nov. 23, 1935, p. 1675), citing his own experience with vegetable oils in the diet. He also calls attention to the deleterious effects of the lack of vegetable oils in the diet of the Japanese. Vegetable oils have been used from time immemorial by all races as a food.

However, the aim of our paper was to decry the promiscuous use of linseed oil as a therapeutic agent in atopic conditions.

Recently our attention was called to another article on hypersensitiveness to linseed oil by Dr. Charles Sutherland (*M. J. Australia* **2**:661 [Nov. 15] 1930). Two patients who were asthmatic had severe attacks of asthma after the use of linseed oil. Linseed oil and cottonseed oil contain active atopen and may produce symptoms by inhalation, ingestion or as a contactant, in atopic individuals. Coca emphasizes this fact, particularly with reference to cottonseed oil, in his book on asthma.

Samuel J. Taub, M.D.
Samuel J. Zakon, M.D.
Chicago.

COLON IRRIGATIONS

To the Editor:—If there is no agreement regarding a therapeutic measure that has been in use for a long time, its alleged value may properly be questioned. Yet if it continues to be employed by a number of careful clinical observers it may have a usefulness that other observers have failed to note. This applies to colon irrigations, the desirable attitude toward which is not exaggerated abuse by those who do not use them or overweening praise by those who do, but a correct estimate of their value and indications.

Such an appraisal is attempted by Dr. Frank H. Krusen in his article in The Journal of January 11. In large measure I agree with what he says. But as he has quoted me freely may I be permitted to point out what seem to me some erroneous impressions given by his paper.

1. The terms "mucous colitis" and "ulcerative colitis" he apparently considers synonymous, for he contrasts my favor of the use of irrigations in mucous colitis with Bargen's objections to it in ulcerative colitis. Later he says "The observations of Bargen tend to show that colonic irrigations are contraindicated in 'mucous colitis' and the consensus among experts in the field would tend to support Bargen's contentions." In the article from which this was abstracted (Chronic Ulcerative Colitis, *Am. J. Digest. Dis. & Nutrition* **1**:190 [May] 1934) Bargen was not speaking of mucous colitis but solely of ulcerative colitis. Mucous colitis is not ulcerative colitis and, like Bargen, I am opposed to the use of irrigations in the latter condition.

In my paper on colon irrigation in The Journal, Feb. 27, 1932, I gave several possible uses for irrigations, but my employment of them is confined almost exclusively to patients with mucous colitis. Even in arthritic patients I continue their use only if mucous colitis is present. To remove toxic matter my use of them is almost limited to patients with acute or subacute food poisoning. When there is chronic intestinal putrefactive toxemia, more can be accomplished by regulation of the diet and of the bowel movements. The nature of mucous colitis is by no means fixed in the minds of the profession; indeed, some consider it a myth, notably Dr. A. F. Hurst of London. My reasons for believing it a clinical entity and my conception of its nature are given at length in *Medical Clinics of North America* (**18**:883-910 [Nov.] 1934).

2. The author quotes Rankin, Bargen and Buie: "Almost invariably irrigation with medicated solutions, continued over a time that is long enough to have effect, makes for increased irritation and abdominal discomfort. . . . Tidy has suggested that medicated enemas continued over a period of time would induce colitis in healthy individuals." What do these writers mean by medicated solutions? Are they liquids containing salt, sodium bicarbonate, soap, peppermint, turpentine, silver nitrate or what? Have the authors evidence, not suggestions, that any or all of these liquids produce colitis, and if so, under what conditions of use? These questions I ask solely for the sake of truth, for like these physicians I am opposed to the use of medicated irrigation fluids. But condemnation of the use of medicated fluids cannot be construed into condemnation of all irrigations. I regularly employ plain water. Physiologic solution of sodium chloride is next best, but I think that it is too readily absorbed, for its use is often followed by the necessity of emptying the bladder two or three times within an hour or two. All colon contents normally contain much water, but no one would suggest that such contents ever resemble physiologic solution of sodium chloride or are isotonic with it.

3. As indicating lack of approval of irrigations by physicians, the author reports extremely few calls for them in his hospitals. I find that in hospitals with a physical therapy department not only is an extra charge made for an irrigation but the patient must be conveyed from the bedroom to the irrigation room under a fixed appointment time. Usually the apparatus is cumbersome and elaborate, and the nurse fills the patients' ears with laudation of the particular method employed. Physicians have stated to me that they do not like such hospital schemes and prefer to have irrigations given in bed with simple apparatus by the patient's nurse. However, judging from my many years' experience on the attending staffs of two active general hospitals, the indications for irrigation are rather infrequently encountered in bed patients. Therefore the number of calls for irrigations in a physical therapy department is not a measure of their approval by the physicians of the community.

I am not an irrigationist but a therapeutist, and my judgment is that simply administered colon irrigations have a definite though limited use in the practice of medicine. This communication is intended as constructive and not destructive criticism of Dr. Krusen's paper.

Walter A. Bastedo, M.D., New York.

ATROPINE AND BELLADONNA IN STOMACH DISORDERS

To the Editor:—I have read Dr. Walter A. Bastedo's article "The Value of Atropine and Belladonna in Stomach Disorders," which appeared in The Journal, January 11, page 85, in which he states that "In single maximum doses by hypodermic injection, atropine may have a limited value in reducing secretion and spasm. . . ."

My interest in the parenteral use of atropine goes back two years, at which time a patient with gastric crisis was being treated. The vomiting had persisted for several days in spite of medication, including the subcutaneous administration of atropine, but stopped within five minutes after the intravenous administration of 0.6 mg. (1/100 grain) of atropine. The result was so miraculous that other symptoms, thought to be related to the parasympathetic nervous system, have been treated similarly.

From 0.4 to 0.5 mg. (1/150 to 1/120 grain) of atropine dissolved in about 1 cc. of saline solution has been used intravenously.

Phenobarbital sodium (2 grains, or 0.13 Gm.) was given at the same time in two instances when the psychic element seemed to be quite prominent. Relief from nausea, vomiting and pain was obtained within two to five minutes in patients with smooth muscle spasm secondary to a peptic ulcer or pylorospasm.

The relief from the intravenous use of atropine has almost been phenomenal with other symptoms thought to be related to the parasympathetic nervous system. Thus the pain in angina pectoris, biliary dyskinesia or that associated with the grasping of a gallstone in the neck of the gallbladder, and ulcerative colitis, the dyspnea of asthma, and, in two cases, cardiac extrasystoles have been stopped. The intravenous atropine has not been effective with pain secondary to coronary thrombosis, infection and necrosis (pancreatitis), or to the presence of a foreign body (common duct stone, hydrops of the gallbladder, ureteral stone). It did not help the pain in one patient who had had an operation for gallstones and who felt that a stone had been overlooked and who subsequently was cured by an exploratory operation (psychoneurosis).

The intravenous administration of the maximal doses of atropine has a definite place in the relief from certain types of pain. It also serves to differentiate similar pains (such as angina pectoris and coronary thrombosis, biliary dyskinesia and common duct stone). It has been given in doses of from 0.3 to 0.6 mg. and repeated, if necessary, at fifteen minute intervals until signs of atropinism appeared. It is difficult to explain the discrepancy in the action of such large doses given intravenously and subcutaneously, unless it might be that through the intravenous route the maximum dose is available immediately. No bad effects have been noted in the dosage used.

The use of atropine intravenously in gastric crisis was suggested by Dr. Joseph Earle Moore in The Modern Treatment of Syphilis, Springfield, Ill., Charles C. Thomas, 1933.

EARL R. LEHNHERR, M.D., Boston.

"IONIZATION TREATMENT OF HAY FEVER"

To the Editor:—The report on the ionization treatment of hay fever, by Ramirez (THE JOURNAL, January 25, p. 281) should be followed by reports from rhinologists who have had experience with this treatment. The ionization of the nasal mucosa is applied for two conditions—hay fever and hyperesthetic rhinitis. There is now sufficient evidence that in many cases this treatment has merit. Hollender of Chicago has used zinc ionization for perennial catarrh for some years with successful results. His experience has been corroborated by Hurd and myself in New York. At a recent meeting at the New York Academy of Medicine, a report from the Manhattan Eye, Ear and Throat Hospital was most encouraging.

During the 1934 hay fever season I had encouraging results in the treatment of hay fever by ionization. In a summary of the results in forty private cases before the Pan American Medical Association, I concluded as follows: "Although we are satisfied that zinc ionization of the nasal mucosa is worth while, it should be understood that no definite endorsement of the treatment should be given until one has a record of cases extending over a number of years. We are inclined to feel that no promise should be made in any case. . . ."

When I returned to America, I again used ionization in a number of cases of hay fever. I was amazed and dismayed to find that hardly one case was relieved. It is impossible for me to give any reason. However, 90 per cent of the cases of hyperesthetic rhinitis were relieved.

I have great respect for the allergist. But how many allergists can claim that they have accomplished more than a seasonal relief in cases of either hyperesthetic rhinitis or hay fever? This does not lead me to write a paper condemning the inoculation treatment. It has its place, and I feel sure that ionization of the nasal mucosa has its place also.

HAROLD HAYS, M.D., New York.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

LOSS TO THE COMMUNITY FROM SYPHILIS

To the Editor:—Are any figures available to show the economic loss to the community from syphilis? You quote Usilton's statement that over a million patients with primary and secondary syphilis seek treatment yearly. What proportion of these become inmates of insane hospitals, and what is the cost of caring for the early and late cases?

CHARLES E. WELLS, M.D., Randolph, Mass.

ANSWER.—References to the economic cost of syphilis, collected from various sources or in the form of original statistics, are given by Thomas Parran Jr. (Public Health in New York State, published by the State of New York Department of Health, Albany, 1932, pp. 236-238) and by J. H. Stokes (Modern Clinical Syphilology, Philadelphia, W. B. Saunders Company, 1934, pp. 1103-1105 and 1309-1310). Parran says:

Based on an estimated attack rate of syphilis of 4.4 per 100,000 for up-state New York, and 7.8 for New York City, there would be 81,000 new infections per year. A moderate estimate of the cost per year for treating adequately a case of early syphilis is $200. Hence, adequate care for syphilis in New York State would cost around $16,000,000 a year.

Outpatients: At the present time up-state clinics are admitting new cases at the rate of 5,000 annually, and administering about 150,000 treatments; at a moderate estimate of the cost at $2 per treatment, this would be a $300,000 service.

Institutional: In state institutions there are approximately 2,000 patients suffering from general paralysis. The cost of building and equipping state institutions is approximately $4,000 per capita. Thus, facilities in state institutions for the care of cases of general paralysis are valued at about $8,000,000. The cost of maintenance, not including administrative cost or charges on investments, is approximately $400 a year per patient. The annual cost for the maintenance of 2,000 cases of general paralysis would be approximately $800,000.

The above estimates represent only a small part of the economic loss of syphilis. Loss of income because of disability, hospital costs aside from mental disease hospitals, and loss because of the shortened life span of those infected, represent an enormous burden, the total of which cannot be accurately estimated.

Stokes says:

Williams estimated that ten men insane from syphilis represented a net loss based on life expectancy of $212 to $248 in earning capacity, and a cost to the state of Massachusetts of $39,312. According to the census of 1910, there were 180,000 insane persons in the United States. Estimating 12 per cent of insanity to be due to syphilis and the experience of Massachusetts to be applicable to the country as a whole, the economic loss in earning capacity and cost of care on the score of a single item in the total bill of syphilis would approximate $467,000,000.

Parran estimates that the cost of adequately treating syphilis as a public health problem would be $0.88 per capita annually; that the loss due to the shortened span of life of patients with dementia paralytica represents a cost of $1.20 per capita, and the loss due to death from other forms of syphilis represents more than $10 per capita for the population of this country.

Figures on the cost of treating syphilis vary widely, with comparatively recent publications on the subject by Keidel, Bromberg and Davis. Since such treatment costs represent forms of economic loss, the following summary of these authors' observations is quoted from Stokes:

An estimate of $500 for the treatment of a syphilitic infection to standstill or cure has been followed by Keidel's figures of $380 as minimum private rates for a period of fifteen months, and an average rate of $650. Two studies by Bromberg and Michael Davis . . . indicate that private care ranges from $273 to $723 per case, with a maximum of $1,425 under individual private care. By an effective form of organization, these rates can be reduced to $135 with $300 a fair average figure. The actual cost of treating a patient at the Johns Hopkins Hospital for syphilis amounts to $1.03 per visit, and with an average total of seventy-six visits over a period of twenty-seven months the patient with early syphilis must meet a cost of $78.

With reference to the prevalence of neurosyphilis among inmates of insane hospitals, Parran (p. 237) estimates that dementia paralytica develops in from 2 to 5 per cent of the cases of syphilis. The average annual admission to state insti-

tutions for mental disease in up-state New York total 856 cases from this cause. Stokes (p. 1103) quotes approximately the same figures for the incidence of dementia paralytica from Mattauschek and Pilcz, Fischer, Pick and Bandler, and Furbush. The Metropolitan Life Insurance statistics quote the incidence of tabes and dementia paralytica as from 13.1 to 16.6 per hundred thousand. Kirby gives the hospital admissions for dementia paralytica in New York State over a period of years as 8.4 per hundred thousand. Marie gives the incidence of dementia paralytica in Egypt as 5.5 per hundred thousand. As a factor in neuropsychiatric work, dementia paralytica is rated by May as the cause of 11 per cent of 70,000 first admissions to forty-eight hospitals in sixteen different states in this country. Richards, in White and Jelliffe's textbook (quoted by Southard and Solomon), states that dementia paralytica constitutes from 5 to 7 per cent of all military cases of mental disease in the French, German, American and Russian armies.

The most recent figure released by the United States Public Health Service, apropos of the inquirer's quotation of figures of "over a million patients with primary and secondary syphilis seeking treatment yearly," is 518,000 new cases for 1934.

CHRONIC OSTEO-ARTHRITIS

To the Editor:—A man, aged 60, complains of a snapping or cracking in his neck when he turns his head from side to side. This condition has existed for several years but has been more noticeable lately. Recently the back of his head and neck have been sore constantly. Examination reveals very slight tenderness on pressure over the cervical spines and the muscles to either side. When he turns his head the cracking sound is distinctly audible. There is no history of trauma and no stiffness or limitation of motion. Physical examination is otherwise essentially negative. Would roentgen rays be likely to reveal any positive changes? I would appreciate suggestions as to possible causes and method of treatment.

M.D., New York.

ANSWER.—Many elderly people complain of these symptoms. The cause is almost invariably a low-grade chronic osteoarthritis of the small lateral articulations of the cervical vertebrae. These are true joints, with capsule, ligaments, articular surfaces, synovial membrane and synovial secretions, and they are affected by arthritis in the same manner and with the same results as any other joints.

In many cases, roentgenograms will show characteristic "lipping" of the bodies of the vertebrae, these osteophytes being most noticeable in the anterior edges, in the lateral view. Such lipping also occurs in the actual articulations but cannot be seen as well in the roentgenograms.

When the head is rotated, crepitation occurs exactly as it occurs in arthritic knee joints.

The treatment of the condition is the removal of any obvious focus of infection, plus improvement of the general health and resistance. The use of autogenous or stock vaccines is still under discussion. Foreign protein injections have their advocates.

Moist, hot fomentations locally and acetylsalicylic acid will tend to relieve exacerbations. In severely painful cases, a Thomas collar or a well fitted steel and leather apparatus to immobilize the head and neck will afford immediate comfort. It need not be worn continuously.

The general tendency is toward improvement in most cases under treatment, with a high percentage of symptomatic cure.

FRACTURE OF THE JAW

To the Editor:—An infected fracture of the inferior maxillary bone is hard to get and hold in place by various dental methods. There is an external fistula, which has drained pus for several weeks. Dilute solution of sodium hypochlorite when introduced into the external fistula passes into the mouth by the teeth. Some small slivers of bone have been discharged from the external fistula. One passed up at the side of or between the front teeth. If no other method will hold the jaw together, is it good surgery to drill holes into the jaw and wire it when pus is present? If not, how soon will it be considered safe to do such an operation? The fracture is about 2 inches to the left of the median line. The external fistula goes to bone at the point of fracture.

M.D., New Mexico.

ANSWER.—In the case cited there are two problems to be considered. First, the reduction of the fracture with the restoration of normal occlusion, and, second, the control of the infection. The simplest and best method of reducing the fracture and restoring the normal occlusion is by the attachment of an Angle's ribbon arch to the upper teeth, using ligature wires on the bicuspids and molars and silk ligatures on the incisors. A similar piece of Angle's ribbon arch is attached to the lower jaw, on the short fragment only, in the same manner. Small orthodontia rubber bands are then attached to the wires in the two jaws, and it will be found that by elastic traction the displaced fragment will be quickly drawn into place and held with complete immobilization. This method not only corrects the fracture but gives the patient considerable freedom in jaw movements, permitting the taking of soft foods and proper cleansing of the mouth.

The fistula should be irrigated once a day with an iodosaline solution, which is easily made by taking as a base physiologic solution of sodium chloride and adding thirty or forty drops of tincture of iodine to a glassful. Continued suppuration in a compound fracture is almost always due to dead bone. A roentgenogram should be taken to determine this point. It is sometimes advisable to allow these small sequestrums to work to the surface, where they can easily be removed, rather than undertake a more pretentious operation.

The management of jaw fractures is outlined in THE JOURNAL, May 19, 1934, page 1655.

The proposed wiring of the bones should not be undertaken, because in the first place it does not insure the restoration of occlusion and, because of the infection, the wires usually have to be removed, leaving a bad scar. The simple method of elastic traction will insure a perfect occlusion, requiring no operation and no anesthetic.

NONALLERGIC SOAP

To the Editor:—Will you please inform me as to the name of the manufacturer of a nonallergic soap? S. E. WITT, M.D., New York.

ANSWER.—There probably is no such thing as a strictly nonallergic soap. Although every kind of soap contains one or more ingredients that sometime or other will cause trouble to the skin of certain individuals.

Some soaps, especially those impregnated with chemicals, seem to be more harmful than the milder ones, but even the mild ones may cause some trouble.

The following materials, which are contained in some soaps, have already been reported as causes of contact dermatitis. This list is by no means complete: oil of bergamot, boric acid, borax, cottonseed oil, formaldehyde, hydrous wool fat, lilac, saponated solution of cresol, mercury compounds, orris root, quinine, resorcinol, rice, phenol, coconut oil.

In general, it would seem safe to avoid highly scented or highly colored soaps. There seems to be some evidence that shaving soaps are less irritating, on the whole, than are the ordinary toilet soaps.

FECAL FISTULA

To the Editor:—What is the treatment, medical or surgical, of a fecal fistula that developed ten days following a resection of a sigmoid carcinoma with primary anastomoses? Kindly outline the immediate and remote treatment.

M.D., New York.

ANSWER.—The immediate treatment of a fecal fistula is directed primarily toward prevention of irritation and excoriation of the skin. The secretion of a fecal fistula following resection and anastomosis of the sigmoid, being in the left half of the colon, is more or less formed and not liquid. It is necessary, therefore, to change dressings only several times daily to remove the accumulated fecal discharge and cover the surrounding skin with a protective dressing of petrolatum, zinc oxide, 3 per cent tannic acid, powdered kaolin, or kaolin glycerin paste. If there is infection of the wound with redness and induration of the skin, this must be treated first by hot dressings and provision for adequate drainage.

The fistula itself, once established, may be curetted and cauterized with phenol, silver nitrate, the actual cautery or surgical diathermy to destroy the granulations or epithelium of the sinus. This is often sufficient to produce permanent closure. Injections of irradiated petrolatum or Beck's paste followed by irradiation have been reported successful in effecting closures.

Almost a third of the fistulas will heal spontaneously within six to eight weeks. The fistulas that persist do so chiefly because of two factors: obstruction within the bowel distal to the sinus, due to a spur or growth, and lining of the tract by epithelium or mucous membrane. These persistent fistulas require surgical excision. In deciding when a fistula should be closed, one should be guided by the amount and character of the drainage, the inconvenience it causes, the condition of the surrounding skin and subcutaneous tissues and the patient's general condition. Approximately three months may be permitted to elapse.

The operative removal of a fistula consists in isolation of the whole tract from the skin to its entrance into the intestine, its separation from the skin and the intestine, and the closure of the resultant defects in the intestine, abdominal wall and skin.

The fistulous tract can be more easily followed if it is filled with an indigo carmine or methylene blue solution. During the operation the introduction of a probe facilitates the finding of the tract. As a rule, however, it is not difficult to trace the fistulous canal, because it is clearly differentiated from the surrounding tissue by its firmness and fibrous structure.

TIC DOULOUREUX

To the Editor:—A white woman, aged 64, has attacks of very severe knifelike pains in the right side of the head. These seem to radiate up from the right side of the neck, where she has a large tumor. She has had an enlarged thyroid gland since she was 10 years old. Twenty years ago the enlarged gland was given eight roentgen treatments and became smaller. She has been feeling well till this year, when she began having these very severe headaches. Drugs other than morphine seem to give no relief. The blood pressure is 190 systolic, 100 diastolic, but during an attack it goes to 220/100 and the heart becomes very irregular in rate and rhythm. Following an attack of this severe headache she will vomit consistently for three or four days, vomiting as little as a teaspoonful of water. Examination of the neck reveals an enlarged thyroid extending from the left side across the neck to the right, and the growth extends to the angle of the jaw. Pressure on the right side causes pain, and continued pressure will set off an attack of the severe headache. The eyegrounds show multiple areas of retinal degeneration, with degeneration in the macula of the right eye. (She constantly sees a dark spot floating in front of the right eye, more so during an attack of headache.) The visual fields are contracted in both eyes. There are no choked disks. The headaches come about every five or six days. Please suggest a possible diagnosis and cause of the condition; also drug treatment to control the headaches and, finally, treatment, if any, to help this patient.

M.D., Pennsylvania.

ANSWER.—From the description given it would seem that the pain is of the nature of a tic douloureux rather than of a headache. For this reason, a description of the distribution of the pain would have value. Study of the condition of the pupil during an attack should be made and observations of the relation of the increased hypertension to the attack; that is, whether it precedes or follows the onset. It is possible that as a result of the roentgen treatment there has been caused a sclerosis of the tumor tissues, with involvement of the carotid sheath and sympathetic fibers and perhaps also of the vagus. Increased intracarotid pressure, like pressure on the tumor from without, from any cause might then cause irritation of the sympathetic fibers and thus give rise to pain. If further study gives any support to this hypothesis, the possibility of some form of sympathectomy should be considered. Whether any such operation is possible in this case must be determined after careful general and local examination. Consultation with an experienced neurosurgeon is certainly indicated.

TINNITUS AND VERTIGO

To the Editor:—A man, aged 57, has a great deal of trouble with dizziness. He gets attacks of tinnitus especially when he mounts a stepladder but he may have them when he is walking around and even while he is lying down. The duration of this trouble has been about a year and a half; onset was gradual and the attacks have become more frequent and severe. There are no other complaints. He does not get nauseated nor does he have any headaches. Simply when he turns his head quickly the dizziness comes on and passes away in a few moments. The physical examination is essentially negative. He wears glasses. There is no nystagmus. The blood pressure is 140 systolic, 82 diastolic. The chest and heart are normal, and the urine and blood show no abnormalities. The Wassermann reaction is negative. There is no diminution in hearing. My impression is that the seat of the disturbance is in the labyrinth. Do you think my diagnosis is correct? What bothers me is the treatment. I have prescribed phenobarbital, one-half grain (0.03 Gm.) twice a day and thyroid, 1 grain (0.065 Gm.) daily, which seems to have benefited the patient to some extent. I would appreciate any suggestions as to treatment.

M.D., Minnesota.

ANSWER.—It is quite probable that the disturbance in this case originates in the labyrinth as suggested by the correspondent. The exact nature of the lesion, however, cannot always be determined, but it may be of a vasomotor character. In some of these instances there is an allergic factor; therefore it would be advisable to have complete tests made to determine whether any protein sensitization is present. Otherwise the use of a mild sedative, such as has already been employed, is often of benefit. So far as the tinnitus is concerned, that also may be due entirely to an inner ear or auditory nerve involvement, and in such a case the use of sedatives is likewise sometimes beneficial. On the other hand, if there is any involvement of the middle ear or eustachian tube the application, after cocainization, of 1 per cent silver nitrate to the pharyngeal orifice of the eustachian tube several times a week sometimes diminishes the tinnitus. Years ago the late Dr. B. Alex Randall of Philadelphia reported good results in cases of tinnitus from the application of 1 per cent ethylmorphine hydrochloride to the eustachian tube by means of a catheter. Tinnitus is only a symptom that may be due to lesions in the eustachian tube, the middle ear or the inner ear and auditory nerve, but the factors that are directly responsible may be not merely local but systemic, either because of changes in the blood itself, hypertension or subhypotension, or toxemias of various kinds arising from infection of the tonsils, teeth, gallbladder or gastro-intestinal tract. Careful study of the whole body is therefore needed in some of these instances, and consequently despite all efforts some cases respond poorly to all forms of treatment or medication, whereas others are quite amenable.

ALLERGIC EDEMA OF SCROTUM

To the Editor:—Information concerning the possible cause and treatment of recurring attacks of edema of the scrotum will be appreciated. A man, aged 49, married, enjoyed excellent health until the past eighteen months, when he began to have attacks of edema of the scrotum, coming on every two or three months and usually clearing up in the interval. They are of very sudden onset and never were associated with pain, itching or general symptoms until the last two times, when there have been general malaise and fever. The edema seems to involve only the skin and is symmetrical. The general examination is normal, including the serum Wassermann reaction. The genitalia are normal. There has never been fluid inside the tunica. There has never been a hernia on either side. He has had no operations except tonsillectomy and excision of fistula in ano. For many years he has had what has been diagnosed as eczema of the scalp and occasionally of the back. There is no other allergic history. He has never had a venereal infection. These attacks are not related to intercourse.

M.D., Texas.

ANSWER.—On the information outlined, the most likely diagnosis would be angioneurotic edema. The fact that the swelling is confined to the scrotum is quite in line with other cases of recurrent localized allergic swellings, such as one eye, the tongue, or a hand. The presence of eczema of long duration lends additional credence to the possibility of an allergic etiology for the edema.

The causes are varied and numerous. Food allergy is one of the most common. Drug sensitivities should be investigated. Contact allergens should also be considered. Allergic swellings on the basis of fungous sensitization secondary to trichophyton or monilia infection should be ruled out. Is it possible that the "eczema" has ringworm as an underlying basis? Finally, the question of focal infection needs attention, since many instances of angioneurotic edema are due to infections in the gallbladder, tonsils, teeth, prostate and disturbances in the gastro-intestinal tract. By history, examination, skin tests and elimination diets the etiology may be ascertained.

The treatment will, of course, be dependent on the etiologic factor that may be found. Until such time as the cause can be located, or in the event of failure to determine such a cause, other therapeutic procedures may have to be tried. Peptone, 0.5 Gm. orally one-half hour before meals, is helpful in cases of food or gastro-intestinal origin. Parathyroid extract-Hanson (10 units) hypodermically, every day or two and then less often, will frequently control the condition. Autohemotherapy with from 10 to 20 cc. of whole blood is often successful. Ephedrine may control the swelling temporarily.

DIAGNOSIS OF PARALYSIS AGITANS

To the Editor:—What does the spinal fluid show in cases of paralysis agitans? Does laboratory examination reveal any other characteristics? Please omit name.

M.D., Illinois.

ANSWER.—There are no characteristic spinal fluid changes in cases of paralysis agitans. The fluid is clear and is usually under slight pressure during the excitatory stage. There are no abnormal cells or unusual chemical changes in the fluid.

There are no definite laboratory observations in cases of paralysis agitans except for the pathologic changes and the associated conditions, which may simulate Parkinson's disease. The pathologic changes usually affect the basal ganglions. Persons are attacked with this disease usually between the ages of 50 and 70 years. There is a degeneration within the striate body and the globus pallidus, causing atrophy of the ganglion cells and their fibers.

There are other forms of parkinsonism. Manganese produces severe degeneration in the basal ganglions. Carbon monoxide poisoning frequently attacks the basal ganglions, particularly

the anterior ends of the globus pallidus. The gas also affects other structures in the brain as well. The laboratory examination here consists of carbon monoxide determination of the blood. Trauma to the brain may attack the basal ganglions and produce the syndrome of paralysis agitans. Hemorrhage or softening leads to the formation of gross lesions in the basal ganglions.

EFFECTS OF NEOARSPHENAMINE

To the Editor:—Is there any difference in the systemic effect of neoarsphenamine given intravenously and intramuscularly? The vision of a young woman with well marked optic neuritis is reduced to hand movements at 20 feet. To my surprise her physician told me that he was giving her neoarsphenamine intramuscularly. She has several hard and painful lumps on her back, the site of injection. I have never heard of neoarsphenamine being injected intramuscularly and am wondering if there is anything unusual, especially as regards the eyes, when so given.

O. M. CRENSHAW, M.D., Lebanon, Ky.

ANSWER.—Few syphilotherapists in this country have had experience with the intramuscular injection of neoarsphenamine because the local reactions from the mode of treatment are as a rule so severe that but few patients will tolerate more than one injection. Not infrequently necrosis and ulceration follow the intramuscular injection. In the early experience with neoarsphenamine many injections were given intramuscularly and many of these patients still carry these infiltrated nodules in their buttocks or intrascapular regions at the site of the injections. Reports from Europe indicate that the therapeutic use of the intramuscular injection of neoarsphenamine has a more pronounced effect on the serum reaction than does the intravenous injection. Colonel Harrison of London and Dr. R. L. Sutton of this country have been advocates of this form of administering the neoarsphenamine, and a discussion of the mode of treatment will be found in the sixth edition of Sutton's book on "Dermatology."

PERFORATION OF NASAL SEPTUM

To the Editor:—A white girl, aged 12, came to me in August 1935 with a perforation in the anterior part of the nasal septum, the diameter of which is 3 or 4 mm. In February 1935 she had severe lobar pneumonia, from which she has recovered. Her mother says that ever since the pneumonia the girl has had trouble with her nose. When the perforation occurred is not known. It is painless and bleeds rather easily. The tissue around the perforation looks healthy. The general condition of the child is negative. There is no history of tuberculosis or syphilis either in the patient or in her family. The Kahn test for syphilis in the patient was 1 plus, the blood of her father was negative, and her mother's was reported "doubtful, probably negative." Scrapings from the perforation were negative for acid-fast organisms. I hesitate to treat this girl for syphilis with no further evidence than I now have. I would appreciate any suggestions as to the further management of this case. What is the accepted treatment for this nasal perforation due to tuberculosis?

M.D., Colorado.

ANSWER.—From the history as given and the site of the perforation in the anterior cartilaginous portion, it is most likely that the lesion is a traumatic (nontuberculosis and nonsyphilitic) one. Tuberculosis of the septum is exceedingly rare; syphilis of the septum nearly always involves that part of the septum which contains bone in addition to cartilage; namely, the posterior half. The history that this condition followed a severe attack of pneumonia probably points to the time of onset; crusting may take place at these times; the patient is too sick for the proper nasal hygiene and may also pick the nose frequently. Under the circumstances, the simplest treatment here would be the best. The nose should be kept well lubricated with an oily preparation or petrolatum to reduce crusting, and the margins of the perforation should be touched up with some such preparation as dilute silver nitrate or dilute trichloracetic acid.

OBLITERATING VASCULAR DISEASE IN AGED

To the Editor:—A man, aged 68, has had a definite diagnosis of Buerger's disease. About a week ago when a blood count was made I found that he had an erythrocyte count of 5,770,000 and hemoglobin 99 per cent. Is this due to the disease or is he experiencing the beginning of polycythemia? I may also mention that for the past two weeks he has been suffering from dyspnea, vertigo, weakness and loss of appetite, from which patients with polycythemia suffer.

C. O. ANDERSON, M.D., St. Petersburg, Fla.

ANSWER.—A man, aged 68, who has occlusion of the major arteries of the extremities is more likely suffering from arteriosclerosis obliterans than thrombo-angiitis obliterans or Buerger's disease. The occlusive process is a bland, noninflammatory thrombosis in an arteriosclerotic vessel. In some patients with advanced forms of arteriosclerosis there is evidence of concentration of the blood, as demonstrated by moderately elevated blood counts and by an increase in the concentration of hemoglobin and an increase in the percentage of cells as determined by the hematocrit. The blood changes are those of a relative polycythemia, not a true polycythemia. The spleen is not enlarged and the veins in the retina are not engorged, nor are the mucous membranes excessively red. It is likely that the symptoms of which this patient complained were due to arteriosclerosis of the cerebral and cardiac arteries rather than polycythemia. The cause of the blood concentration in arteriosclerosis is not clear. It was first described by Galsbach in association with hypertension.

STERILITY

To the Editor:—Among my patients I have a young couple who are desirous of having a baby but after two years of trial have been completely unsuccessful. The woman is 28 years of age and states that she has had no venereal infection of any sort. The menstrual periods have always been regular and attended with cramps until a few years ago. Vaginal examination reveals a normal uterus, normally placed. Smears of the vaginal tract show no gonococci, but the smears are strongly acid to litmus paper. There is no abnormal discharge. Her husband is in good health and up until a few years ago was a rather heavy indulger in alcohol. There is no history of venereal infections. Microscopic examination of the semen shows a fair rate of motility, but many of the sperm cells are motionless. (The specimen was examined soon after intercourse.) There is no hypospadias. I have advised abstinence for a period of a few weeks and then the use of alkaline douches just before intercourse. Can you advise any other methods I may suggest should these procedures fail? What is the present consensus as to which period in the menstrual cycle is the optimal time for conception to take place?

M.D., Ohio.

ANSWER.—A thorough investigation in accordance with the plan of Meaker will probably reveal one or more causes for reproductive failure. A postcoital test of the spermatozoa should be made from the vaginal vault and cervical canal; if a large number of living spermatozoa are recovered from the cervix, a test for the patency of the fallopian tubes should be made. If the results of these tests are satisfactory, the couple should be advised to hold intercourse at such time as is most likely to result in pregnancy, namely, in the mid month period. It is the present consensus that ovulation occurs from fourteen to fifteen days before the onset of menstruation. It is also believed by many that the ovum is susceptible of being fertilized for but two days and that a human spermatozoon can fertilize the ovum for no more than three days; therefore repeated cohabitation in the midmonth week appears to be logical advice.

SEXUAL HYPERSENSITIVENESS WITH COLON SPASTICITY

To the Editor:—A man, aged 40, unmarried, has the following complaints: 1. Sexual hypersensitiveness. Since puberty he has been uncomfortable in the presence of women and has an erection. He therefore avoids riding in trolley cars and any other contact with women. It has had a serious economic effect. 2. A spastic colon, corroborated by roentgen examination. When the colon symptoms are worse he feels sexually more uncomfortable. (Is his sexual symptom due to the colon or it is a separate condition?). 3. Weakness. He gets up tired in the morning, cannot do strenuous work, and gets tired early in the evening. He has had silver nitrate instillations in the urethra. The colon has been treated by a smooth diet, rest and antispasmodic drugs. He would be satisfied if his sexual condition was relieved. This would enable him to do his work better and change his outlook on life. Please give your suggestions. He requires ten hours of sleep. His father sleeps as soon as he sits down, even at meals (probably narcolepsy). Kindly omit name.

M.D., Pennsylvania.

ANSWER.—Sexual complaints such as those described are much more common in single than in married men. They bear evidence of nervous sensitivity. The so-called spastic colon is another indication of hypersensitiveness of the nervous system. A condition in which much intestinal spasm and abdominal discomfort prevail is better known as an "irritable colon" associated with nervous fatigue. Both of these complaints at once suggest that the condition is not primarily one of malfunction of the intestine or the sexual organs but rather a part of a systemic disturbance. The sexual dysfunction, intestinal irritability and easy fatigue all point to a highly sensitive and easily disturbed nervous system.

Treatment should not be directed toward the relief of any of these symptoms singly but rather to the relief of the nervous fatigue. This will be best accomplished by adopting a well ordered program of rest and restful recreation, plenty of outdoor exercise, fresh air and sunshine, and some program of recreational diversion that will be pleasant for the individual. There are no drugs advocated for these conditions which offer more than transient relief.

PERSISTENT SUPERFICIAL INFECTION

To the Editor:—A youth, aged 17, injured the anterior surface of the right lower leg while playing football five years ago. The wound consisted of a rather insignificant abrasion which, however, developed into a severe infection with a high fever and an abscess formation in this vicinity which required drainage. There are now two scars about the size of a half dollar (30 mm.). I first was called to see him about two years ago when he complained of pain in the region of these scars. He had a temperature of 104 F., and there was considerable redness around the area with enlargement of the inguinal glands. The process subsided with rest, elevation and heat. This, however, recurs about every four to five months, sometimes following a slight bump and sometimes without any trauma. Roentgenograms of the tibia and fibula are negative, and the serology is normal. A careful search was made for any foci of infection but none were found. This trouble caused him considerable economic loss, and any advice that you can offer on how to rid him of it will be appreciated.

M.D., Ohio.

ANSWER.—This patient's history suggests that there are virulent bacteria still present in the tissues which are reactivated from time to time and cause active inflammation. Although it is unusual for bacteria to remain in the tissues as long a time as is indicated by this patient's history, there is abundant evidence available to indicate that bacteria can remain viable in the soft tissue for over a year and in bone for a considerably longer period.

There is no direct method of attack available in the treatment of such conditions. To carry out any surgical operation would be a certain way of stirring up trouble. The patient would be best advised to do everything possible to safeguard his general health and to avoid any local traumatism or injury about the site of the original wound.

CONTROLLING ETHYLENE DANGERS

To the Editor:—Will you please advise the general policies followed for having x-ray units in the surgical department where ethylene gas is used? We are contemplating revamping our surgical suite, and if it is an acceptable policy to do so, we are considering having our cystoscopic table with a Kenetrom transformer and control stand in a room adjoining one of our major operating rooms, this room to be used in combination with our fracture service. We have a fracture table and have just recently purchased a shock-proof and ray-proof mobile x-ray unit. Any information you may give us, with reference to general policies followed in having x-ray service (such as I have outlined) in the surgical department where ethylene gas is used, will be appreciated.

RALPH M. HUESTON, Joliet, Ill.

ANSWER.—The most conservative and safest practice adopted by those with experience is to avoid ethylene-oxygen anesthesia under conditions in which the use of an open flame, electric cautery, radio knife or any electric sparking device is indicated. As the inquirer undoubtedly knows, intravesical explosions may have occurred during fulgurations of the urinary bladder owing to the liberation of explosive gases even when the anesthetic mixture used was simply nitrous oxide-oxygen. Had ethylene-oxygen anesthesia been used, every one would have attributed the explosion to that anesthetic. Everything considered, ethylene-oxygen, ether, or nitrous oxide-oxygen-ether anesthesia should not be employed when the danger of ignition of these inflammable mixtures by "sparking" electrical apparatus is even remotely possible. Nitrous oxide-oxygen is the only positively safe anesthetic to use under these conditions.

PHLEBITIS AFTER GONORRHEA

To the Editor:—Sept. 12, 1934, a patient came in with all symptoms of an acute gonorrhea, such as frequency, burning and a discharge. Two weeks later he developed a periurethral abscess, which was incised and drained. This was followed with considerable edema of the foreskin, which was incised several times. October 25 the left testicle began to swell, accompanied by severe pain, and several days later the left inguinal gland became swollen. Two weeks after the testicle began to swell the left leg became painful, especially around the thigh. The whole leg down to the ankle became edematous to approximately one and one-half times the normal size. There was no pain on motion and no pains in the joints. The patient was in bed about seven weeks from October 25. In the meantime the discharge was continually present and positive until May 13, 1935, when on resumption of urethral instillation, sounds and massages the discharge became negative and stopped. Now after eight months the pain in the leg is less severe but still present and accompanied by a slight amount of edema. The veins around the posterior surface of the knee are dilated and prominent. What line of treatment would you suggest for the leg condition, which is in my opinion a gonorrheal phlebitis? Kindly omit name.

M.D., New York.

ANSWER.—The swelling and pain in the legs is in all probability due to phlebitis, the origin of which may have been gonorrhea, although this is not common. Rest, elevation and the application of moist heat plus the internal administration of iodides are indicated.

Medical Examinations and Licensure

COMING EXAMINATIONS

ALASKA: Juneau, March 3. Sec., Dr. W. W. Council, Juneau.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written examination for Group B applicants* will be held in various cities throughout the country, March 14. *Oral examination for Group A and B applicants* will be held in Kansas City, Mo., May 11-12. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Written examination and review of case histories of Group B applicants will be held in various cities of the United States and Canada, March 28. *Applications must be filed not later than February 28.* Oral, clinical and pathological examination of all candidates will be held in Kansas City, Mo., May 11-12. *Applications must be received not later than April 1.* Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: Kansas City, Mo., May 11, and New York, Sept. 26. *All applications and case reports must be filed sixty days before date of examination.* Asst. Sec., Dr. Thomas D. Allen, 122 S. Michigan Ave., Chicago.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Kansas City, Mo., May 11. *Applications should be filed with the secretary on or before April 1.* Sec., Dr. Fremont A. Chandler, 180 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: Kansas City, Mo., May 9. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: Kansas City, Mo., May 9. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: St. Louis, Mo., May 8-9. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: Kansas City, Mo., May 8-10. Sec., Dr. B. R. Kirklin, Mayo Clinic, Rochester, Minn.

ARIZONA: *Basic Science.* Tucson, March 17. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson. *Medical.* Phoenix, April 7-8. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

CALIFORNIA: Los Angeles, March 9-12. *Reciprocity.* Los Angeles, March 18. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: *Regular.* Hartford, March 10-11. *Endorsement.* Hartford, March 24. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Homeopathic.* Derby, March 10. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven.

IDAHO: Boise, April 7. Commissioner of Law Enforcement, Hon. Emmitt Pfost, 205 State House, Boise.

IOWA: Des Moines, Feb. 25-27. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MAINE: Portland, March 10-11. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MASSACHUSETTS: Boston, March 10-12. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413 State House, Boston.

MONTANA: Helena, April 7. Sec., Dr. S. A. Cooney, 7 W. 6th Ave., Helena.

NATIONAL BOARD OF MEDICAL EXAMINERS. *Parts I and II.* May 6-8, June 22-24, and Sept. 14-16. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NEW HAMPSHIRE: Concord, March 12-13. Sec., Board of Registration in Medicine, Dr. Charles Duncan, State House, Concord.

NEW MEXICO: Santa Fe, April 13-14. Sec., Dr. E. LeGrand Ward, Santa Fe.

OREGON: *Basic Science.* Portland, March 21. Sec., Mr. Charles D. Byrne, University of Oregon, Eugene.

PUERTO RICO: San Juan, March 3. Sec., Dr. O. Costa Mandry, Box 536, San Juan.

WEST VIRGINIA: Charleston, March 16. State Health Commissioner, Dr. Arthur E. McClue, Charleston.

WISCONSIN: *Basic Science.* Madison, April 4. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

Texas November Report

Dr. T. J. Crowe, secretary, Texas State Board of Medical Examiners, reports the written examination held in Houston, Nov. 18-20, 1935. The examination covered 12 subjects and included 120 questions. An average of 75 per cent was required to pass. Thirteen candidates were examined, 12 of whom passed and 1 failed. Sixty-four candidates were licensed by reciprocity and 1 candidate was licensed by endorsement. The following schools were represented:

PASSED		
School	Year Grad.	Per Cent.
College of Medical Evangelists	(1935)	85.6, 87
School of Medicine of the Division of the Biological Sciences	(1935)	90.3
Harvard University Medical School	(1933)	88.7
University of Nebraska College of Medicine	(1934)	86.4
Duke University School of Medicine	(1933)	91
Baylor University College of Medicine	(1931) 76, (1935)	79.7
Medizinische Fakultät der Universität Wien	(1934)	86.3*
Université Catholique de Louvain Faculté de Médecine	(1934)	85
Universidad Nacional Facultad de Medicina, México, D.F.	(1934)	79*
Osteopath†		77.1

FAILED		
School	Year Grad.	Per Cent
Escuela de Medicina de San Luis Potosi, Mexico	(1935)	34.6*

LICENSED BY RECIPROCITY		
School	Year Grad.	Reciprocity with
University of Arkansas School of Med.	(1934, 4), (1935, 2)	Arkansas
College of Medical Evangelists	(1930)	Minnesota
University of Colorado School of Medicine	(1934)	Colorado

George Washington University School of Medicine	(1910)	Dist. Colum.
Emory University School of Medicine	(1934)	Georgia
American College of Medicine and Surgery, Chicago	(1905)	Illinois
Chicago Homeopathic Medical College	(1903)	Illinois
Northwestern University Medical School	(1931)	Minnesota
University of Illinois College of Medicine	(1934)	Illinois
Indiana University School of Medicine	(1923), (1934)	Indiana
University of Louisville School of Medicine	(1930)	Kentucky
Tulane University of Louisiana School of Medicine	(1929), (1931), (1932), (1934, 4), (1935, 2)	Louisiana
Johns Hopkins University School of Medicine	(1929)	N. Carolina
University of Maryland School of Medicine	(1909)	Maryland
Harvard University Medical School	(1927)	Mass.
Tufts College Medical School	(1930)	Michigan
University of Michigan Medical School	(1933)	Michigan
University of Minnesota College of Homeopathic Medicine and Surgery	(1908)	Minnesota
University of Minnesota Medical School	(1929), (1930)	Minnesota
St. Louis University School of Medicine	(1925)	Missouri
Washington University School of Medicine	(1929), (1930), (1934)	Missouri
Long Island College Hospital	(1929)	New York
New York Homeopathic Medical College and Flower Hospital	(1919)	New York
New York University, University and Bellevue Hospital Medical College	(1911)	New York
Ohio State University College of Medicine	(1924)	Ohio
Toledo Medical College	(1901)	Ohio
University of Cincinnati College of Medicine	(1935)	Ohio
University of Oklahoma School of Medicine	(1931), (1934, 3)	Oklahoma
Meharry Medical College	(1933) Kansas, (1934, 2)	Tennessee
University of Nashville Medical Department	(1908)	Louisiana
University of Tennessee College of Medicine	(1916), (1932)	Tennessee
Vanderbilt University School of Medicine	(1910) (1920) Louisiana, (1934) Tennessee	Missouri.
Universidad de la Habana Facultad de Medicina y Farmacia	(1920)	Florida
Universität Köln Medizinische Fakultät	(1921)*	Wisconsin
Osteopaths†		Iowa, 2, Missouri, 3

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
University of Texas School of Medicine		(1931)	U.S.Navy

* Verification of graduation in process.
† Licensed to practice medicine and surgery.

District of Columbia Reciprocity Report

Dr. George C. Ruhland, secretary, Commission on Licensure, reports 15 physicians licensed by reciprocity from Oct. 15 through Dec. 11, 1935. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Georgetown University School of Medicine	(1923), (1932) New Jersey, (1933) Maryland, Virginia		
Howard University College of Medicine	(1923) (1932) Georgia, (1932), (1933) Maryland		New York,
State University of Iowa College of Medicine		(1924)	Iowa
Johns Hopkins University School of Medicine	(1925), (1928) (1931) Michigan.		Maryland,
Washington University School of Medicine		(1912)	Missouri
Jefferson Medical College of Philadelphia		(1915)	Penna.
University of Virginia Department of Medicine		(1926)	Virginia

Kansas December Report

Dr. C. H. Ewing, secretary, Kansas State Board of Medical Registration and Examination, reports the written examination held at Topeka, Dec. 10-11, 1935. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Eleven candidates were examined, all of whom passed. Nineteen physicians were licensed by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Colorado School of Medicine		(1928)	85
Howard University College of Medicine	(1934) 88.2,	(1935)	84
Northwestern University Medical School		(1935)	87, 88.1
Rush Medical College		(1935)	85.1
Creighton University School of Medicine		(1933)	87.9
University of Nebraska College of Medicine		(1935)	88.5
University of Oklahoma School of Medicine		(1934)	84.5
University of Oregon Medical School		(1934)	88.6
Meharry Medical College		(1935)	84

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists		(1931)	California
Northwestern University Medical School		(1929)	Missouri
University of Illinois College of Medicine		(1932)	Illinois
Keokuk Medical College, Iowa		(1899)	Iowa
State University of Iowa College of Medicine		(1927, 2)	Iowa
Johns Hopkins University School of Medicine		(1912)	Maryland
University of Minnesota Medical School		(1928)	Minnesota, (1929) North Dakota
University Medical College of Kansas City, Missouri		(1900)	Missouri
Creighton University School of Medicine		(1932)	Nebraska
John A. Creighton Medical College		(1917)	Montana
University of Nebraska College of Medicine	(1933), (1934)		Nebraska
Western Reserve University School of Medicine		(1930)	Ohio
University of Oklahoma School of Medicine		(1934)	Oklahoma
Meharry Medical College		(1933)	Tennessee
Vanderbilt University School of Medicine		(1932)	Tennessee
University of Wisconsin Medical School		(1933)	Missouri

Book Notices

Obstetrical Practice. By Alfred C. Beck, M.D., Professor of Obstetrics and Gynecology, Long Island College of Medicine. Cloth. Price, $7. Pp. 702, with 1,043 illustrations. Baltimore: Williams & Wilkins Company, 1935.

This new textbook on obstetric practice is presented by a prominent educator in this field. His pedagogic skill is amply evidenced by the clear, logical presentation of his subject to the student and young practitioner. The various chapters present chronologically the story of the various birth processes and their pathologic complications. The ideas are in line with modern scientific advances. All debatable, questionable or theoretical ideas have been omitted for the sake of conciseness. The chapter on antepartum care covers the field completely, emphasizing the great value of this form of prophylactic obstetrics. The mechanism of labor in all the varieties of presentation and position are thoroughly discussed and profusely illustrated. The author feels that a proper understanding of this subject will result in fewer pathologic conditions, with the resultant decrease in maternal and fetal mortality and morbidity. For the same reason a long chapter is devoted to a complete discussion of the medical and surgical complications of pregnancy. There is a lack of relative value in the space devoted to various subjects. Thus one finds forty pages devoted to an excellent discussion of face presentation, which, according to the author, occurs once in 250 labors, while thirteen pages are devoted to a too brief discussion of all the toxemias of pregnancy, and eleven pages to the ever increasingly important problem of abortion. The chapter on operative obstetrics is placed at the end of the book. The various operations are described briefly, although carefully illustrated, emphasizing the view that operative obstetrics should be reserved for the specialist who has had additional training. All the chapters are profusely illustrated. The drawings have been done by the author himself and retouched by an artist. Their uniformity, clarity and number do much to help the teaching value of the text and improve greatly the general appearance of the book. Throughout the book one finds pictures and short biographies of the many interesting personalities that have slowly evolved the science and art of obstetrics. An excellent, selected bibliography follows each chapter. This book can be heartily recommended for students and young practitioners.

Lactobacillus Acidophilus and Its Therapeutic Application. By Leo F. Rettger, Ph.D., LL.D., Professor of Bacteriology in Yale University, Maurice N. Levy, M.D., Louis Weinstein, Ph.D., and James E. Weiss, Ph.D. Cloth. Price, $2.50. Pp. 203. New Haven: Yale University Press; London: Oxford University Press, 1935.

This book should be good, seeing that for twenty years the senior author has been studying intestinal bacteriology and particularly the problem of implanting acidophilic organisms in the bowel.

It is interesting now to learn that L. bulgaricus, which for so many years was sold widely and bruited about as a wonderful rejuvenator of mankind, not only does not become implanted in the bowel but actually is rapidly destroyed there. Surely the physician who knows anything about the history of therapeutics will always outdoubt St. Thomas when there comes to his desk the first enthusiastic description of marvelous cures obtained with some new drug; and, as some wag once advised, he will hurry to use the new drug while it is still curing. How annoying it must be to the men who have bragged about a wonderful new cure for, let us say, nausea, to have some pharmacologist come along and show that the drug is really a mild emetic.

Dr. Rettger's enthusiasm is all for L. acidophilus, which he is sure can be implanted in the bowel under certain definite and essential conditions. In the first place, enormous numbers of active living bacilli must be given. According to Rettger, most of the preparations on the market contain only a few half-dead organisms. But even if the bacteria in the little tablets and bottles were all viable there would still be too few to make any change in the intestinal flora. In the second place, the strain used must be one that is adapted to life in the intestine; and, in the third place, the culture must not have been maintained too

long on artificial mediums. The bacterium is one that is highly adapted to its natural medium, and it loses this specificity when, after several transplantings, it learns to live in the test tube. Finally it is essential that from 200 to 300 Gm. of dextrin or lactose be given daily so as to modify the p_H of the colonic contents.

As Rettger says, in their attempts to use acidophilic bacteria therapeutically, few physicians have taken the trouble to fulfil all the necessary conditions, and as a result there has "been an undermining of confidence in the principle involved."

Another great difficulty arises when one comes to the matter of choosing patients suitable for this type of treatment. The reviewer must admit that he has always been much puzzled to know what type of patient would most probably be helped. He has never been able to learn enough about the intestinal flora to know when he wanted it changed or how he wanted it changed. The wise physician does not want to burden people with a troublesome and expensive type of treatment unless there is a large probability that it will do them some good. The writer of this review has found it possible to try out lactobacillus implantation only when he could secure the help of a trained bacteriologist. First, much time had to be spent in maintaining active cultures of an organism which is often hard to grow. Secondly, the milk had to be sterilized and then heavily seeded with the lactobacillus. Finally, the patients had to go to the trouble of sending to the laboratory at frequent intervals to get their supply of the product.

When a mountain has to labor to this extent, it usually wants to know what kind of a mouse is to be brought forth. According to the book before us, three out of four of a few patients with simple constipation were helped, and this improvement lasted for from twelve to sixteen weeks following discontinuance of the treatment. Good results were seen also in a few patients with "constipation with biliary symptoms," whatever that means. Three out of four patients with mucous colitis were helped, and seven out of eight patients with ulcerative colitis showed improvement, in spite of the fact that in none of them was there an implantation of the lactobacillus. Patients with mucous colitis and ulcerative colitis received benefit only so long as the treatment was being carried out.

We of the medical profession should feel deeply indebted to Dr. Rettger for debunking this form of treatment, which has been so badly misrepresented since the days of Metchnikoff, and for showing us how useless it is to give lactobacilli unless the procedure is carried out by experts who will check every stage to make sure that they are doing what they planned to do. Finally we must thank Rettger for his frankness and honesty in saying that, so far, the treatment has been found useful temporarily in such illnesses as constipation and mucous colitis, which can be controlled fairly well in simpler and much cheaper ways.

The Single Woman and Her Emotional Problems. By Laura Hutton, B.A., M.R.C.S., L.R.C.P., Physician, Institute of Medical Psychology. With a foreword by David Forsyth, M.D., D.Sc., F.R.C.P. Cloth. Price, $2. Pp. 151. Baltimore: William Wood & Company, 1935.

This little book should be in the library of every physician, psychologist, sociologist, teacher, clergyman; in short, all those who come in mental contact with the large and increasing class of women whose problems stimulated Dr. Hutton to write the book. Not only teachers and advisers can profit from a careful study of this short, concise, well written manuscript but there are few women who could not profit through assimilating some of Dr. Hutton's sympathetic, objective and accurate analysis of the reality situations to be faced, the need for help and guidance to these women who are intentionally or unintentionally single. In the preface Dr. Hutton says: "Explanations of the psychological meaning of certain types of behavior or symptoms need always to be approached with the utmost care and gentleness . . . sympathy, understanding and respect for personality, above all undisturbed by any fear or condemnation of sexual manifestations in whatever guise they may appear are essential; and this principle holds throughout whether we are dealing with physical symptoms which are recognized as being expressions of emotional and particularly psychosexual conflicts and repressions or with explicit psychological difficulties." Dr. Hutton does just that, lucidly, clearly and in a frank, straightforward manner. The book contains five short chapters devoted chronologically to (1) the single woman of today—a historical and present-day analysis of the situation; (2) emotional friendships and some of the psychologic problems involved —a discussion of normal and abnormal friendships among women; (3) sexual problems—those confronting the single woman; (4) sexual inversion; (5) adjustments. Dr. Hutton quotes or refers to several well known psychoanalysts and gives credit to their views. The book is in no way dogmatic or critical unless it be of the adviser and teacher who is utterly lacking in insight and attempts to be pedagogic rather than understanding and unbiased. Dr. Hutton is an English physician and while the book is primarily written for and about the English situation, the problems discussed are equally relevant in this country.

Précis de chimie biologique médicale. Par Paul Cristol, professeur de chimie biologique et médicale à la Faculté de médecine de Montpellier. Cloth. Price, 80 francs. Pp. 638, with 13 illustrations. Paris: Masson & Cie, 1935.

This is a good textbook of biochemistry for medical students. In the introduction, the historical aspect is first emphasized and the relation of biochemistry to various interests is briefly referred to. The first chapter presents elementary information on the physical-chemical relations, such as ionization, osmotic pressure and the colloidal state. A chapter on elementary composition contains some interesting data on the quantitative distribution of inorganic constituents. After another chapter of general nature devoted to the organic composition and classification, the more systematic treatment follows. A good chapter on hydrocarbons presents the more important information on the chemistry and function of hydrocarbons in plants and animals. Part II covers in thirteen chapters the chemistry and metabolism of carbohydrates and the terminology and evaluation of acidity and p_H. The structural relations between the different monosaccharides and between the tautomers involved in the action of bases and in mutarotation are not presented clearly. The actions of strong mineral acids on carbohydrates and of bromine on reducing sugars are not adequately covered. It is also rather unusual to discuss the asymmetrical carbon atom after considerable material has been presented which involves its knowledge. The synthesis of carbohydrates in plants, the various fermentations of carbohydrates, and the changes in the digestive tract and blood sugar and its regulation are well presented. The biochemistry of diabetes is given well with the exception of the ketogenic and antiketogenic values of various foods. While the basis of p_H terminology is given clearly, the development of the buffer action in tissues and body fluids is given too simply. Part III, in three chapters, covers lipins. The treatment of phospholipins and cerebrosides is very brief. The chemistry of sterols, bile acids and related compounds is treated fairly well, but the information on vitamin D and sex hormones is not as critical and complete as one might desire. Curiously, Brown-Séquard is the only one referred to in connection with the internal secreting function of the gonads. Part IV, in twelve chapters, covers the chemistry and metabolism of proteins. With the exception of too brief a treatment from the physical-chemical point of view, the discussion on this phase is very satisfactory. Each chapter is preceded by a good summary, and an excellent subject index is provided.

Radium Treatment of Skin Diseases, New Growths, Diseases of the Eyes, and Tonsils. By Francis H. Williams, M.D., Senior Physician, Boston City Hospital. Cloth. Price, $2. Pp. 118, with 12 illustrations. Boston: Stratford Company, 1935.

In this book Dr. Williams limits himself in subject matter to those details of radium treatment with which he has had particular, personal experience. The opening chapters are devoted to a discussion of some of the physical properties of radium, and a detailed description is given of the fluorometer, an instrument devised by the author, with which he was able to measure, comparatively, the beta ray penetration of radium, in water layers of varying thickness. From the measurements obtained, he lays down some of the principles that guide him in radium treatment. Approximately the latter two thirds of the book recounts the results of Dr. Williams' experience with radium, particularly as applied to a limited group of lesions of

the skin, eye and throat. Descriptions and photographs of instruments developed and used by the author are included with the text, as well as details of the technic of application. In general, it may be said that the author's observations are not only clear and easily understandable but also borne out by the experience of other radium therapists, working elsewhere. The past twenty-five to thirty years has furnished sufficient evidence to corroborate beyond all doubt the truth of the general laws and principles laid down by Dr. Williams. As an approach to the broader subject of radium therapy as now generally practiced the book may prove misleading, in that the action of gamma rays is minimized and most radium therapists are not treating infected tonsils or cataracts with radium at this time. The impression might conceivably be formed by the reader that radium is effective almost entirely as a result of the action of beta rays. This volume will no doubt prove of most interest and value to one already familiar with radium and its use, since its emphasis is on a limited field of radium therapy and development of technic as applied to these particular conditions by Dr. Williams. Generally speaking, the book is of interest and presents the experience, methods and technic of one individual in a limited field. It presents many of the problems that confronted the early workers with radium and the author's methods of solving these problems. The book is interesting reading but gives too little space to the more recent advances in the use of radium to be of much aid in the practice of radium therapy in the more commonly accepted methods and technic today.

Handbook of Bacteriology for Students and Practitioners of Medicine. By Joseph W. Bigger, M.D., Sc.D., F.C.R.P.I., Professor of Bacteriology and Preventive Medicine, University of Dublin. Fourth edition. Cloth. Price, $4.25. Pp. 458, with 93 illustrations. Baltimore: William Wood & Company, 1935.

This book was the outcome of some dissatisfaction with the larger textbooks on bacteriology frequently expressed to the author by medical students. His object in writing a book was therefore to supply accurate information on bacteriology in a form suitable for students. That he has done so is indicated by the fourth edition of his book published in ten years and further by the appearance in 1935 of the first Spanish edition. The author appears to have included in the latest edition all the advances in bacteriology that appear sound and of importance to medical students. By deleting less important material he has kept the book to exactly the same number of pages as the previous edition. There have been added also a number of colored plates and nine new illustrations; two thirds of the pages in this edition have been changed to bring the book down to date, so rapid have been the advances in bacteriology in the three and a half years since the third edition came out. Its handy size is an advantage to students who have many books to carry about.

Experimentelle Untersuchungen über Amöbenruhr. I. Teil: Krankheitsverlauf bei künstlicher und spontaner Übertragung der Amöbiasis. Von Dr. Oskar Wagner. Beihefte zum Archiv für Schiffs- und Tropenhygiene, Pathologie und Therapie exotischer Krankheiten, Band XXXIX, Beiheft 1. Gegründet von C. Mense. Herausgegeben von P. Mühlens, Direktor des Instituts für Schiffs- u. Tropenkrankheiten, Hamburg. Paper. Price, 3 marks. Pp. 48, with 6 illustrations. Leipzig: Johann Ambrosius Barth, 1935.

A human strain of Endamoeba histolytica retained its virulence after having been transferred for eight years, intrarectally, from kittens to kittens, from kittens to dogs, and vice versa. Similarly, cultures of Endamoeba histolytica failed to lose their virulence. In kittens the disease ran a rapid course, with incubation period very short, about two days, in the majority of cases, followed by a bloody diarrhea, loss of weight and appetite, and finally death after several days. Ninety per cent of the young kittens died within five days after onset of the symptoms. Older heavier cats were less frequently infected and lived longer. Old heavy cats occasionally recovered spontaneously. Of 1,553 infected cats, forty-three recovered spontaneously. Young kittens never recovered spontaneously. Young puppies (60 per cent from 2 to 3 months old) were more easily infected than old dogs, which recovered spontaneously. With the increase in age and size dogs become more resistant to infection with Endamoeba histolytica than cats. In dogs the symptoms were much milder and spontaneous recovery much quicker than in cats. Liver abscesses were also less frequent. Occasionally young dogs developed amebic ulcers of the small intestine and stomach, showing trophozoites in the bloody mucous secretions. Attempts were made to infect rats, monkeys, guinea-pigs and rabbits, but without success. Healthy monkeys as well as rats harbor amebas similar to Endamoeba histolytica except that they were unable to produce amebic dysentery in kittens from amebas obtained from these sources. Young puppies became spontaneously infected when exposed in a cage with an infected puppy whose stool showed trophozoites of Endamoeba histolytica, but no cysts. Dogs became infected in nature through ingesting human feces containing Endamoeba histolytica cysts. By feeding experiments in which only trophozoites of Endamoeba histolytica were used, young puppies and kittens became infected. Feeding Endamoeba histolytica cysts to a cat and dog resulted, after a long period of incubation (from fifteen to forty-five days), in infection.

Eat, Drink and Be Wary. By F. J. Schlink. Cloth. Price, $2. Pp. 322. New York: Covici, 1935.

This is a typical example of the output of Mr. Schlink as a leader of Consumers' Research. Encouraged, no doubt, by the public reception given to "100,000,000 Guinea Pigs," Mr. Schlink continues to strain at sensationalism in his desire to hold his audience. Unfortunately Mr. Schlink is a chemist by training and not a physician and he is apparently utterly unable to evaluate scientific medical evidence properly. For example, Dr. Eddy in *Good Housekeeping* has told readers that there are no dangers from poisons in modern enamels on cooking ware; Mr. Schlink tells them that Consumers' Research has found poisons in enamels. Of course, the significant fact is not that there are poisons in enamels but whether or not such poisons in enameled cooking ware possess any real potentialities for poisoning those who use the cooking ware. This is the difference between the chemical and the biologic approach. Dr. Eddy in *Good Housekeeping* says that gelatin is a good protein. Mr. Schlink comes forth with the old bugaboo that gelatin is made from hoofs and hides and he insinuates, therefore, that it is not a good protein. Sausage is made from portions of meat that used to be thrown to the fertilizer, yet the Eskimos have proved to us that most of the glands and entrails are valuable in the diet. Liver used to be cat meat and is now more valuable than steak. It would be easily possible to go through this entire book page by page and to point out similar exaggerations and misinterpretations of scientific evidence.

Mr. Schlink continues to quote profusely from THE JOURNAL and other American Medical Association publications; in fact, the majority of his material comes from these sources, yet he does not hesitate to bite the hand that feeds him and to quarrel with some of the official bodies of the American Medical Association on points concerning which he himself is not competent to judge satisfactorily.

For those who are really serious about securing real information on the physiology of foods and digestion, the book by Mr. Schlink cannot be recommended. To those who want their imaginations titillated by muckraking, Mr. Schlink's book will probably be welcome.

International Bibliography on the Problems of Blood Transfusion and the Theory of Blood Groups, 1900—1933. Edited by Dr. E. Koenig and Prof. E. Hesse. [In Russian, German, English, French and Italian.] Paper. Price, 12R. 50K. Pp. 226. Leningrad: Research Institute of Blood Transfusion, 1935.

This bibliography presents the titles of 4,423 articles on blood transfusion published in the world literature since 1900. Titles of papers published in English, German, French, Italian or Russian are printed in the original language. The Russian publications are printed in Russian and German. Titles of papers from sixteen other countries are printed in German. The enormous material is divided into twenty-two groups and seventy-seven subgroups. For instance, the whole literature on blood groups is given on seventy-three pages, with 1,861 titles. Papers on technic and indications are quoted in the same exhaustive manner. No article is reported in more than one section, but at the end of every section the corresponding numbers of articles previously referred to are cited. Thus easy access to the world literature is given to anybody who is interested in any phase of blood transfusion. Investigation of the previous publications on the different problems of blood

transfusion can be carried out now in the shortest time, instead of days or weeks spent in looking up the literature. This bibliography is a monumental work. The authors should be congratulated on their brilliant accomplishment. In recent years a great deal of new and original work on blood transfusion has originated in Russia. This book expresses the active interest which our Russian colleagues take in the popularization of blood transfusion.

Medicine for Nurses. By W. Gordon Sears, M.D., M.R.C.P., Deputy Medical Superintendent, St. Charles' Hospital, London. Cloth. Price, $3.25. Pp. 412, with 46 illustrations. Baltimore: William Wood & Company, 1935.

This is a treatise based on a series of lectures to nurses. The material is written in a compendious style with additions made to emphasize the importance of nursing in the various conditions. Apparently irrelevant material is included to cover the possibility of future examination questions. In several instances the treatment and prophylactic measures detailed are not the most modern. For instance, toxoid in diphtheria is not mentioned, gauze dressing on a vaccinia pustule is advocated, nasal catheter administration of oxygen in pneumonia is described as a method of choice, and active immunization against scarlet fever is omitted. Except for these few shortcomings, the volume is easily readable, covering a large subject well within the grasp of individuals who have not had a sufficient medical education.

Social Problems of the High School Boy. By Alba M. Lyster, Chairman, Arts and Sciences, the Vocational and Technical School, San Antonio, Texas, and Gladys F. Hudnall, Chairman, Home Economics, Austin Senior High School, Austin, Texas. Reviewed for educational value by Benjamin Floyd Pittenger, Ph.D., Dean of the School of Education, The University of Texas, Austin. Cloth. Price, $1.75. Pp. 340, with 71 illustrations. Austin, Texas: Steck Company, 1935.

This book is intended to help the high school boy make his social adjustments. The reviewer and his wife have gone through it more or less carefully expecting to find a whole lot of prissy directions concerning the fine points of etiquette which would be practiced only in the upper brackets of society. They found little or nothing of the sort. Instead here are things that every boy should know. He is given the principles of physical health and something concerning the food he should eat; manners are discussed in considerable detail; the boy is instructed in the principles by which he may choose and wear his clothing; he is given a great many hints as to how to decorate his room; there are many suggestions about the choice of a vacation; he is told how to cook simple foods in case his mother or his wife should be ill; the choice of a mate is sensibly discussed; his relation to other boys and to girls is taken up in a logical and attractive manner. The information in this book will be a tremendous aid in making the transition from high school boy to useful man. Every high school boy and his parents should have a copy of it.

Restauration et prothèse maxillo-faciales: Fractures—pertes de substance—difformités. Par les Drs Ponroy et Psaume, médecins du centre maxillo-faciale de Paris. VIII, La pratique stomatologique, publiée sous la direction du Dr Chompret. Préface du Professeur Fernand Lemaitre. Cloth. Price, 80 francs. Pp. 502, with 338 illustrations. Paris: Masson & Cie, 1935.

This is the eighth in a series of nine volumes on the practice of stomatology. It contains a wealth of detail and should prove an excellent reference volume for the dental surgeon primarily. The lower jaw is considered in the first part. Line drawings are used exclusively except for reproductions of two roentgenograms and four photographs of two patients. Infinite detail of dental fixation is given and illustrations of many different ideas of splinting and the application of prostheses. Roentgen examination is covered in less than half a page and no diagnostic reproductions are shown. The only two roentgenographic reproductions in the entire book are of a graft across a defect of the body. The second part covers the upper jaw and has a short treatise on cleft palate. The third part considers the covering of the face and includes illustrations of one nasal reconstruction. Many excellent individual procedures may be found throughout the book, with special reference to mechanical features. It might serve the purpose for the general or oral surgeon of giving a better outlook on the dental problems involved; otherwise, the actual management of jaw fractures may be found more practically explained elsewhere.

Outlines of General Psychopathology. By William Malamud, M.D., Professor of Psychiatry, State University of Iowa. Cloth. Price, $5. Pp. 462. New York: W. W. Norton & Company, Inc., 1935.

In this book the author presents systematically a consideration of abnormal mental activity. His presentation is based on actual case reports. In the course of his presentation he outlines the various new conceptions, including behaviorism, freudianism, individual psychology and similar doctrines. In his presentation he develops a psychologic nomenclature. Whereas his table of contents seems abnormally abstruse and difficult, the book itself is easy to read, direct in its approach, and quite comprehensive. It is the kind of volume that may be cheerfully recommended to the general practitioner who wants to orient himself in a field in which most writers are confusing.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Abandonment of Patient; Scope of Experimentation in Medicine.—The plaintiff, because of a swelling of his left knee, consulted the physician-defendant, who took a history of the case, examined his patient manually, and made a diagnosis of sarcoma. He placed his patient on a diet and one week later gave him "an antitoxin injection." Whether the injection was made into the supposed sarcoma, or intravenously, or otherwise, the decision does not disclose. About four days after the injection the skin over the swelling broke open, and a cauliflower mass developed. The defendant dressed the sore with sterile gauze bandages, applied boric acid, and used "pheno isolin,"[1] with morphine to relieve pain. The defendant then—after, the record implies, promising to return—discontinued attendance. The mass of diseased tissue had by that time increased in size and was discharging large quantities of pus, and the plaintiff consulted another physician.

This second physician sent him to a hospital, where roentgenograms were made and a Wassermann test, and where tissue from the diseased area was examined microscopically. Chiefly on the basis of a positive Wassermann test, the lesion at the knee was attributed to syphilis and diagnosed not as a sarcoma but as a gumma. Antisyphilitic treatment was then administered, followed by immediate improvement. The plaintiff returned to work, but he continued to suffer pain and his left leg remained crippled and stiffened. He sued the physician who first treated him, the defendant in this case, claiming that the defendant was negligent in that (1) he failed to exercise the degree of care and skill required of him; (2) he did not use roentgen rays to aid in making a diagnosis; (3) he did not take specimens of tissue for microscopic examination; (4) he injected poisons or harmful drugs "into the blood stream," and (5) he abandoned the plaintiff without cause. The jury returned a verdict of $25,000 in favor of the plaintiff, which the trial court thought excessive, and with the consent of the plaintiff judgment was entered for only $7,000. The defendant thereupon appealed to the Supreme Court of Michigan.

The physician-defendant contended that the admission of mortality tables in evidence in proof of the plaintiff's impaired earning capacity was error, because the plaintiff was in ill health when the physician-defendant was called to attend him and therefore did not belong to that class of persons whose lives form the basis of such tables. The Supreme Court agreed that the admission of mortality tables in evidence under such circumstances was error, as the expectancy of life stated in them is based on the lives of healthy individuals, but the court was of the opinion that by the reduction of the verdict from $25,000 to $7,000 the error had been cured, since the error affected only the amount of the verdict.

The charge of the trial court that if the physician-defendant promised to return to see the plaintiff and never did so, but

1. A proprietary drug, not an antitoxin, but shown by analysis to consist essentially of turpentine, camphor, menthol, and resin dissolved in oil. Condemned as misbranded under the U. S. Food and Drugs Act. See food inspection decision No. 23230, U. S. Dept. of Agriculture.

abandoned him, and damage resulted from that conduct, and that if such conduct was not in accordance with the usual and ordinary practice of physicians in the community and in similar communities, the physician-defendant was liable, the Supreme Court held was correct. The court concluded: "When a physician takes charge of a case and is employed to attend a patient, the relation of physician and patient continues until ended by the mutual consent of the parties, or revoked by dismissal of the physician, or the physician determines that his services are no longer beneficial to the patient, and then only upon giving to the patient a reasonable time in which to procure other medical attendance." The question of abandonment in this case was in dispute and was properly left to the jury.

The record shows, said the Supreme Court, that when the physician-defendant made the manual examination of the plaintiff, the plaintiff had symptoms that would lead a physician to suspect cancer, syphilis, simple tumor, abscess or tuberculosis. The usual practice among physicians in the community in diagnosing the cause of a swelling such as the one on the plaintiff's knee at the time was not only to take a history of the patient but also to have a roentgenogram made, a blood test made, and a microscopic examination of the tissues. A physician is bound to follow the usual and ordinary practice of physicians of ordinary learning, judgment or skill in his own or similar localities. In this case, which was not an emergency case, the defendant did not use ordinary diligence in availing himself of various methods of diagnosis for discovering the nature of his patient's ailment, such as were used by physicians of skill and learning in the community in which he practiced, and he must therefore, in the opinion of the Supreme Court, be held liable for the damage due to his negligence. The Supreme Court recognized, however, "that, if the general practice of medicine and surgery is to progress, there must be a certain amount of experimentation carried on; but such experiments must be done with the knowledge and consent of the patient or those responsible for him, and must not vary too radically from the accepted method of procedure."

The physician-defendant requested the trial court to instruct the jury not to consider the charge that the defendant injected a harmful or poisonous drug into the plaintiff's blood stream, because there was no evidence to support such a claim. The trial court, however, charged the jury that it was alleged in the declaration that the plaintiff had done so and stated that there was some testimony tending to support the allegation. A search of the record, said the Supreme Court, fails to disclose any evidence that the injection given to plaintiff by the physician-defendant was poisonous or harmful, and the trial court should have given the instruction requested by the defendant. The instruction that the court did give erroneously assumed the existence of certain facts, and this, with the court's failure to instruct the jury as requested, was prejudicial error. The effect of it on the minds of the jury could not be ascertained and therefore the erroneous instruction was not cured by the diminution of the amount of the verdict. The Supreme Court, therefore, directed that a new trial be given.—*Fortner v. Koch (Mich.), 261 N. W. 762.*

Malpractice: Statute of Limitations; Concealment of Cause of Action.—The defendant, a physician, operated on one of the plaintiffs, Sept. 2, 1931. He employed Dr. F. F. McMillan to administer the anesthetic. During the operation the patient lost a considerable amount of blood, and tight bandages were applied to her legs. Shortly after the operation the defendant left for another city, without giving orders for the removal of the bandages. He was absent four days. Dr. McMillan, the anesthetist, too left town, and he was absent until the next day after the operation. When and by whom the bandages were removed is not clear from the report of this case, but they were not seasonably removed, and the patient developed ulcerated areas on her legs, with paralysis substantially complete from the knees down. After his return, Dr. McMillan visited the patient a few times, responding apparently to a call by the nurse. Later the defendant treated the patient for a time and finally sent her to a hospital.

For nearly a year the patient and her husband corresponded extensively with the defendant, looking toward a settlement of their claim for the injuries attributed to his negligent treatment. Finally, Aug. 25, 1932, the defendant agreed to pay them $3,500 and they agreed not to sue him, and a covenant was entered into between them to that effect. The patient and her husband did, however, sue Dr. McMillan. In the first trial a disagreement of the jury resulted and in the second trial the jury returned a verdict in Dr. McMillan's favor.

The patient and her husband then instituted action to have the court set aside the covenant into which they had entered with the defendant in this case, by which, in consideration of the payment by him of $3,500, they had agreed to refrain from suing him. They contended that the defendant had practiced fraud on them in obtaining that covenant. He had, they alleged, told them that he had expected Dr. McMillan to care for the plaintiff on whom he had operated, after the operation; that he had made specific arrangements to that effect; that such was the local custom, and that he would so testify if they covenanted not to sue him. The defendant had, however, they alleged, at the first trial of their suit against Dr. McMillan denied that he had made a specific agreement with him to give postoperative care to the patient. The trial court entered a decree setting aside the covenant and declaring that it was not a bar to proceedings by the patient and her husband against the defendant for negligent malpractice. The defendant thereupon appealed to the Supreme Court of Michigan.

In Michigan, actions for malpractice must be instituted within two years from the time the cause of action accrues, but if a physician fraudulently conceals the cause of action, action may be commenced at any time within two years after the person who is entitled to institute action discovers that he has that right. The physician defendant contended, apparently, that even if the covenant not to sue should be set aside, as the trial court had undertaken to do, the statute of limitations had run against the plaintiff's claim for damages arising out of alleged malpractice incident to the operation in 1931. If the plaintiffs, said the Supreme Court, knew that they had a cause of action against the defendant, the time within which they could institute suit had elapsed. The plaintiffs agreed not to sue the defendant and entered into a covenant to that effect, after long negotiations, consultations with counsel, and threats of a suit. It would be incongruous, said the court, to permit a person to plead that the running of the statute of limitations had been stopped by the fraudulent concealment from him of the very same cause of action for which he had accepted a substantial sum in settlement.

The Supreme Court set aside the decree of the trial court declaring the covenant void and reversed the action of that court.—*Weast v. Duffie (Mich.), 262 N. W. 401.*

Society Proceedings

COMING MEETINGS

American Association of Anatomists, Durham, N. C., Apr. 9-11. Dr. George W. Corner, 260 Crittenden Boulevard, Rochester, N. Y., Secretary.

American Association of Pathologists and Bacteriologists, Boston, Apr. 9-10. Dr. Howard T. Karsner, 2085 Adelbert Road, Cleveland, Secretary.

American College of Physicians, Detroit, Mar. 2-6. Mr. E. R. Loveland, 133 South 36th Street, Philadelphia, Executive Secretary.

American Physiological Society, Washington, D. C., Mar. 25-28. Dr. A. C. Ivy, 303 East Chicago Avenue, Chicago, Secretary.

American Society for Experimental Pathology, Washington, D. C., Mar. 25-28. Dr. Shields Warren, 195 Pilgrim Road, Boston, Secretary.

American Society for Pharmacology and Experimental Therapeutics, Washington, D. C., Mar. 25-28. Dr. E. M. K. Geiling, 710 North Washington Street, Baltimore, Secretary.

American Society of Biological Chemistry, Washington, D. C., Mar. 25-28. Dr. H. A. Matill, Chemistry Bldg., State University of Iowa, Iowa City, Secretary.

Federation of American Societies for Experimental Biology, Washington, D. C., Mar. 25-28. Dr. E. M. K. Geiling, 710 North Washington Street, Baltimore, Secretary.

Missouri State Medical Association, Columbia, Apr. 13-15. Dr. E. J. Goodwin, 634 North Grand Blvd., St. Louis, Secretary.

Nebraska State Medical Association, Lincoln, Apr. 7-9. Dr. R. B. Adams, 15 N Street, Lincoln, Secretary.

Oklahoma State Medical Association, Enid, Apr. 6-8. Dr. L. S. Willour, 203 Ainsworth Building, McAlester, Secretary.

Pacific Coast Surgical Association, Del Monte, Calif., Feb. 20-22. Dr. Edgar L. Gilcreest, 384 Post Street, San Francisco, Secretary.

Southeastern Surgical Congress, New Orleans, March 9-11. Dr. Benjamin T. Beasley, 478 Peachtree Street N.E., Atlanta, Ga., Secretary.

Tennessee State Medical Association, Memphis, Apr. 14-16. Dr. H. H. Shoulders, 706 Church Street, Nashville, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1926 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

191: 1-152 (Jan.) 1936

Malignant Lymphoma of Tonsil. H. Jackson Jr., F. Parker Jr. and A. M. Brues, Boston.—p. 1.

*I. Iron and Its Utilization in Experimental Anemia. G. H. Whipple and F. S. Robscheit-Robbins, Rochester, N. Y.—p. 11.

*II. Iron Metabolism: Its Absorption, Storage and Utilization in Experimental Anemia. P. F. Hahn and G. R. Whipple, Rochester, N. Y. —p. 24.

*The After-History of Lipoid Nephrosis. R. H. Major, Kansas City, Kan.—p. 43.

Hyperparathyroidism with Renal Insufficiency: Report of Case. K. A. Elsom, F. C. Wood and I. S. Ravdin, Philadelphia.—p. 49.

Treatment of Gonorrheal Arthritis by Means of Systemic and Additional Focal Heating. W. Bierman and C. Levenson, New York.—p. 55.

Total Blood Fat Determination as an Index of Thyroid Function. C. T. Chamberlain, S. Jacobs and Mary Frances Butler, New Orleans. —p. 66.

Effect of Therapy on Nerve Degeneration in Pernicious Anemia. E. S. Mills, Montreal.—p. 72.

The Heart in Myxedema: Correlation of Physical and Postmortem Findings. W. H. Higgins, Richmond, Va.—p. 80.

Prognosis of Bundle-Branch Block and Other Intraventricular Conduction System Lesions. J. J. Sampson and Ola E. Nagle, San Francisco. —p. 88.

Electrocardiographic Study of Lead IV, with Especial Reference to Findings in Angina Pectoris. H. D. Levine and S. A. Levine, Boston.—p. 98.

Mitral Valve Disease: Pathologic Report. H. W. Dana and J. A. Reidy, Boston.—p. 109.

*Effect of Calcium Injections on the Human Heart. K. Berliner, New York.—p. 117.

Use of Iron in Experimental Anemia.—The thesis of Whipple and Robscheit-Robbins relative to iron utilization in the standardized anemic dog is as follows: Iron given intravenously to a normal anemic dog will be utilized to form new hemoglobin practically on a quantitative basis, 10 mg. of iron equals 3 Gm. of hemoglobin. Therefore, in the same dog under certain conditions the amount of absorbed iron may be estimated from the amount of new-formed hemoglobin. In the emergency due to anemia, the healthy dog will utilize quantitatively the iron as it comes into the circulation just as under similar circumstances it utilizes quantitatively hemoglobin given intravenously to rebuild new hemoglobin for red cells. Assuming that under these conditions new-formed hemoglobin is a reasonably accurate measure of iron absorbed from the intestine, the ratio of iron ingestion may be calculated to new hemoglobin production. For the optimal dose of iron (40 mg. daily) this ratio will be about 3:1, or a 35 per cent utilization of ingested iron. For larger doses of iron (400 mg. daily) this ratio will be about 20:1, or a 5.3 per cent utilization of the iron given by mouth. This is to be compared with the 10:1 ratio for the feeding of whole blood cells by mouth: for 10 Gm. of hemoglobin fed there is a return of only 1 Gm. of new hemoglobin in the standard dog. The figures of standard salmon bread feeding show that the salmon bread iron gives a 40 per cent utilization of this iron. On the average, liver feedings show that the dog utilizes about 44 per cent of the iron contained in normal pig liver in the production of the new-formed hemoglobin. There are many organic and inorganic factors as well as iron that influence hemoglobin production in anemia, and any dogmatic generalizations about "food iron" are not safe. Infection and intoxication will modify internal metabolism and limit the output of hemoglobin in anemia. Bile secretion will also modify the production of hemoglobin in this type of anemia. Eck fistula and splenectomy may modify reactions to iron given intravenously. When iron is given intravenously, a quantitative return is observed even when enormous doses are given, and the body finds the needed building material to supply the globin—a protein making up about 95 per cent of the hemoglobin molecule. When an anemic dog is fasted and given iron intravenously, he will form large amounts of hemoglobin, and much of it must come from body protein stores. A considerable part of this new hemoglobin is formed by conservation of material which under control fasting conditions would be wasted as urea in the urine. Amino acids or organ fractions almost free of iron will cause increased hemoglobin production in the anemic dog. Now the dog must draw iron from depleted stores or utilize the food iron even more completely. The authors found it possible to reach the end of the iron stored in the body and observe a fall in hemoglobin production under such conditions, but the iron conservation within the body must be truly remarkable.

Iron Metabolism.—Hahn and Whipple observed that reserve iron storage in the dog can be exhausted during a period of from two to three months by a continuous anemia with the hemoglobin level maintained at from one half to one third of normal. A rapid turnover of iron is the conspicuous feature of the experiments dealing with iron given by mouth, and short feeding experiments (one to two days) give no evidence of any iron store in the liver. As the iron feeding experiments are lengthened, a variable accumulation of iron in the liver is seen; but the amounts are small and a very rapid appearance of the iron in matured hemoglobin is the conspicuous feature. Parenchyma iron of various blood free organs is relatively a constant in the standardized dogs. Liver, kidney and pancreas average from 1 to 2 mg. of iron per hundred grams of fresh tissue, the lung 3 mg., the spleen from 5 to 6 mg., the red marrow probably in excess of 10 mg. and the striated muscles 3.1 mg., of which about 1.6 mg. is muscle hemoglobin iron, leaving the parenchyma iron as 1.5 mg. Muscle hemoglobin iron and muscle parenchyma iron are inviolate stores of iron, which are not drawn on no matter how great is the emergency due to anemia. Conversely, no surplus iron can be demonstrated in this tissue when iron is given intravenously. Iron depletion can be carried to a point at which there is almost a complete cessation of hemoglobin production in a standard dog on a diet poor in iron. Intravenous iron in the doses given will result in large storage in the liver and spleen, from 55 to 70 per cent of the total iron given. The authors are not prepared to say where the remaining iron is to be located in the body tissues or fluids, but it certainly is not eliminated.

The After-History of Lipoid Nephrosis.—Major discusses the after-history of lipoid nephrosis in six patients, one of whom has been followed for eight years, two for four years and one for three years. Two of the patients died, showing marked acute glomerular nephritis with evidence of chronic glomerular changes at necropsy. Of the four patients living, three are clinically well and one appears in good health and still shows a definite but not constant albuminuria. The three patients who have apparently recovered have been under observation eight years, four and one-half years and four years. The patient who has recovered except for the slight albuminuria has been under observation three years. At one time or other practically every method of treatment recommended has been employed, including high protein diets, blood transfusions, intravenous dextrose, thyroid extract, parathyroid extract and various diuretics, including merbaphen and salyrgan. The authors have given their patients from 70 to 100 Gm. of protein daily. Very high protein diets in their experience present a difficult problem. Studies of the nitrogen balance in two patients also indicated that an excess of protein intake was not stored but excreted as urinary nitrogen. Blood transfusions and intravenous injections of solution of dextrose were apparently of temporary value at least. They have not found thyroid extract or parathyroid extract of any definite value. Bacterial antigens were of questionable value. They have seen no detrimental effects from the use of merbaphen or salyrgan. At times they produce abundant diuresis and at other times no apparent effect. One patient was given intravenous acacia and a few days later developed an acute nephritis with death. This may have been a coincidence. The last three patients have been placed on a high carbohydrate diet of from 600 to 800 Gm. daily, occasionally as high as 1,000 Gm. They have improved remarkably, either as a result of the diet or because of the healing powers of nature.

Effect of Calcium Injections on the Heart.—Berliner found that the intravenous injection of 10 cc. of a 20 per cent solution of calcium gluconate produced changes in the electrocardiograms of twenty-six normal individuals. These changes consisted of flattening or inversion of the T waves in 92 per cent of the cases, flattening or inversion of the P waves in 44 per cent and a marked bradycardia in 67 per cent. Intravenous injection of 10 cc. of physiologic solution of sodium chloride given to eighteen normal individuals had no effect on the electrocardiograms. This investigation, for the first time, supplies experimental proof of the effect of calcium on the normal human heart.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

34: 717-866 (Dec.) 1935

Relationship of Radiology and Surgery: Caldwell Lecture, 1935. J. S. Horsley, Richmond, Va.—p. 717.
Congenital Cystic Lung: Report of Multiple Cysts Within an Accessory Lobe. M. J. Thorpe, San Francisco.—p. 724.
Negative Pressure Chamber in Roentgenologic Demonstration of Pulmonary Disease. H. E. Burke, Ray Brook, N. Y.—p. 730.
Right Sided Diaphragmatic Hernia: Report of Three Cases. H. D. Kerr and S. S. Steinberg, Iowa City.—p. 735.
*Lower Lung Line. E. Korol, Lincoln, Neb.—p. 740.
Intestinal Obstruction. L. R. Sante, St. Louis.—p. 744.
Brief Consideration of Sarcoma of Stomach: Report of Case of Primary Lymphosarcoma. R. Drane, Savannah, Ga.—p. 755.
Improved Technic for Radium Treatment of Carcinoma of Uterine Body. H. Schmitz and H. E. Schmitz, Chicago.—p. 759.
*Preoperative Radium Treatment of Rectal Carcinoma. H. H. Bowing and R. E. Fricke, Rochester, Minn.—p. 766.
*Roentgen Therapy of Thrombo-Angiitis Obliterans (Buerger's Disease). G. E. Pfahler, Philadelphia.—p. 770.
Roentgenologist as an Expert Witness. W. A. Evans, Detroit.—p. 778.
Biologic Measurement of Depth Dosage with 165 Kilovolts and 650 Kilovolts Roentgen Rays. P. S. Henshaw and D. S. Francis, New York. —p. 789.
Capacitor Discharge Apparatus. G. W. Files, Chicago.—p. 798.
Place of Roentgen-Ray Museum in Teaching Program of Medical School. W. E. Chamberlain and B. R. Young, Philadelphia.—p. 811.
Factors Influencing Quantitative Measurement of Roentgen-Ray Absorption of Tooth Slabs: IV. Absorption Coefficient Factors. H. C. Hodge, W. F. Bale, S. L. Warren and G. Van Huysen, Rochester, N. Y.—p. 817.

Lower Lung Line.—Korol points out that in roentgenograms of the upper part of the abdomen there may be seen a horizontal line running from the lateral chest wall toward the first lumbar vertebra on each side. This line (the lower lung line) represents the lower posterior pleural boundary; i. e., the fold of parietal pleura reflected from the posterior chest wall onto the diaphragm. This line may be followed into its junction with the line representing the posterior mediastinal pleural fold. Occasionally the lower anterior pleural fold may also appear as a horizontal line at a slightly higher level than the posterior lung line. The anterior line has been seen only in cases of emphysema; it can be traced on the roentgenogram into the pericardiopleural fold. In cases of emphysema and visceroptosis, also in cases of pneumothorax, the lower lung lines often appear in the chest roentgenograms as horizontal lines crossing the twelfth rib a short distance below the dome of the diaphragm, which is flattened and placed low in these cases. In cases of atelectasis or fibrosis of one lobe with compensatory emphysema of the healthy lobes, the lower lung line often shows on the routine chest roentgenogram, owing to ballooning of the pleural fold by the emphysematous lung.

Preoperative Radium Treatment of Rectal Carcinoma.—At present Bowing and Fricke employ an aggressive preoperative treatment for rectal carcinoma. Platinum-filtered needles (1 mg.) are evenly placed throughout small growths for forty-eight hours, or gold radon seeds are implanted. Contact treatment has also been employed; two or three radon tubes (with 1 mm. of brass, 0.5 mm. of silver and 1 mm. of rubber as filters) are strapped side by side with adhesive tape to form a plaque. The tubes are placed through the proctoscope against the growth after the normal wall of the intestine has been packed away with gauze soaked in metaphen: a dose of from 60 to 100 mg. hours per square centimeter of malignant tissue is employed. This treatment is repeated daily to different areas of the growth until the entire lesion has been covered. Surgical diathermy is used to reduce the bulk of the medullary tumors and to facilitate the puncture method of radium therapy. From 1930 to 1933 inclusive, fifty-eight patients were selected for this form of treatment. The full plan of treatment (that is, radical excision following radium therapy after an interval) was carried out in only thirty-seven cases. Thirty-one of the patients are living at the present time, although two are seriously ill and two others may have residual trouble. The remaining twenty-seven patients appear to be well and free from recurrence. In five of these, complete healing of the posterior wound has not yet occurred. Six patients have been perfectly well for more than four years. Careful microscopic examination of removed tissue was carried out in all cases following surgical excision of the growth. In three cases no evidence of carcinoma was found in the surgical specimen, radium treatment apparently having destroyed all vestiges of the growth. In three other cases the pathologist found that most of the malignant cells had been eradicated by radium.

Roentgen Therapy of Thrombo-Angiitis Obliterans.—Pfahler uses 200 kilovolts and 0.5 mm. of copper filtration in the radiation treatment of thrombo-angiitis obliterans. Since the sympathetic ganglions are approximately from 10 to 12 cm. from the surface of the skin, it seems more logical to use a higher voltage and higher filtration technic. The surface dose will vary therefore with the quality of rays used. He advises from 20 to 30 per cent (150 to 200 roentgens) of an erythema dose at each session. The distance has been usually from 40 to 50 cm. The area usually treated has involved the paravertebral region from the eleventh dorsal to the fifth lumbar vertebra. In some cases this has been divided into four portals, and the treatment through each area is given on separate days or through two areas on each of two days. The larger the area used, the more likely is radiation sickness to occur. From a review of the cases treated, it would seem advisable to treat the patient over the sympathetic ganglions indicated by the location of the disease probably three times a week, until a total of one-half to a full erythema dose has been given over each portal or over the whole area. Such a series may be repeated after an interval of one or two months if necessary. Pain is relieved usually in about two to three weeks after the inception of the treatment, and at times it occurs more promptly. One of the author's patients could walk only a city block, when he would have to stop because of pains in the calf of the legs. He has been completely relieved and three years later can play thirty-six holes of golf at the age of 67. Usually patients have returned to their work in from five to six weeks. The relief of special symptoms has been somewhat as follows: Intermittent claudication disappears sufficiently within two weeks for the patient to walk without distress, and in 50 per cent of the cases reported by Philips and Tunick these symptoms disappeared completely within six weeks. Circulatory and trophic disturbances improve in from four to six weeks. Ulcerations show a tendency to improve within a few weeks and disappear within a few months. Granulations appear and epithelization of the margins is noticed early, and an appearance of an ordinary ulcer is soon established. A tendency for gangrene to become dry was noticed early, and gradually the dead tissue separated and the area healed. Marked general improvement appears rapidly, chiefly owing to the relief of pain.

Anatomical Record, Philadelphia

64: 1-146 (Dec. 25) 1935

Metamorphosis of the Pubic Symphysis: I. White Rat (Mus Norvegicus-Albinus). E. B. Ruth, Rochester, N. Y.—p. 1.
Numerical and Topographic Relations of Taste Buds to Human Circumvallate Papillae Throughout the Life Span. L. B. Arey, M. J. Tremaine and F. L. Monzingo, Chicago.—p. 9.
Changes in Alveolar Epithelium of Rat at Birth. Sylvia Holton Bensley and Muriel B. Groff, Chicago.—p. 27.
Studies of Lining of Pulmonary Alveolus of Normal Lungs of Adult Animals. R. D. Bensley and Sylvia Holton Bensley, Chicago.—p. 41.
Effect of Buffered Phosphate Solutions on Thin Layer of Living, Vascular Tissue in Moat Chambers Introduced into the Rabbit's Ear. R. G. Abell, Philadelphia.—p. 51.
Development of Connective Tissue Fibers in Epithelium-Containing Cultures. W. Bloom and Ruth H. Sandstrom, Chicago.—p. 75.
Hormone Control of Estrus, Ovulation and Mating in Female Rat. E. Witschi, Iowa City, and C. A. Pfeiffer, Cold Spring Harbor, N. Y. —p. 85.
Spectrographic Analysis of Biologic Materials. G. H. Scott and P. S. Williams, St. Louis.—p. 107.
Studies on Anterior Hypophysis: IV. Effect of Male Hormone Preparations on Anterior Hypophyses of Gonadectomized Male and Female Rats. W. O. Nelson, Columbia, Mo., and T. F. Gallagher, Chicago. —p. 129.

Archives of Neurology and Psychiatry, Chicago

35: 1-214 (Jan.) 1936

*Subtemporal and Suboccipital Myoplastic Craniotomy. W. Cone and W. Penfield, Montreal.—p. 1.

Effects of Lesions of Juxtarestiform Body (I. A. K. Bundle) in Macacus Rhesus Monkeys. A. Ferraro and S. E. Barrera, New York.—p. 13.

Hyperthermia Due to Lesions in Hypothalamus. B. J. Alpers, Philadelphia.—p. 30.

Olivopontocerebellar Atrophy. G. B. Hassin, Chicago, and T. H. Harris, Galveston, Texas.—p. 43.

Surgical Pathology of Subdural Hematoma Based on Study of One Hundred and Five Cases. D. Munro and H. H. Merritt, Boston.—p. 64.

Vasomotor Phenomena Allied to Raynaud's Syndrome. M. M. Peet and E. A. Kahn, Ann Arbor, Mich.—p. 79.

*Technic of Injection into Gasserian Ganglion Under Roentgenographic Control. T. J. Putnam and A. O. Hampton, Boston.—p. 92.

Experimental Ptosis in Primates. W. Mahoney and D. Sheehan, New Haven, Conn.—p. 99.

Convulsion Threshold of Various Parts of the Cat's Brain. F. A. Gibbs and Erna L. Gibbs, Boston.—p. 109.

Experimental Studies in Alcoholism: II. Alcohol Content of Blood and Cerebrospinal Fluid Following Intravenous Administration of Alcohol in Chronic Alcoholism and Psychoses. R. Fleming and E. Stotz, Boston.—p. 117.

Subtemporal and Suboccipital Myoplastic Craniotomy.—Cone and Penfield outline a simple technic, myoplastic subtemporal craniotomy, which permits rapid exploration through a wide unobstructed opening and provides a firm, safe restoration. A curved incision is made in the scalp without wounding the pericranium. This incision skirts the superior temporal line to which the fascia of the temporal muscle is attached. Posteriorly the incision is swung slightly forward on the supramastoid crest. The superior temporal line is identified anteriorly by palpation. As this incision is deepened, the pericranium is exposed just beyond the temporal muscle fascia. By palpation the extent of the temporal muscle fan can be outlined quickly by having the patient bite. The scalp flap is reflected from the periosteum until the temporal fascia attached to the superior temporal line of the parietal bone and the posterior part of the temporal ridge of the frontal bone is exposed. An incision is carried down to the calvarium through the line of fascial attachment, and the muscle and scalp flap are reflected from the temporal bone and retracted with two or three guy sutures attached to rubber bands. The bone is removed from the temporal fossa up to within a centimeter or less below the fascial incision. An opening from 9 to 7 cm. is thus readily obtained. To reattach the myoplastic flap, holes are made in the margins of the bone defect, usually from twelve to fourteen, and interrupted chromium steel wire sutures, size 33, are passed through the holes and up through the muscle and overlying fascia and are tied next to the bone. The fringe of fascia and pericranium left attached to the flap as it was reflected is sutured either with interrupted silk sutures or with a continuous locked silk suture, and the scalp is closed in two layers, as usual. In myoplastic suboccipital craniotomy used for bilateral or unilateral exploration of the posterior fossa the incision extends from the level of the tips of the mastoid processes to a point from 4 to 5 cm. above the external occipital protuberance. The lateral wings of the incision are so placed that the muscles of the neck attached to the mastoid process will not be cut, the incision coming down through the occipitalis muscle directly to the periosteum of the mastoid bone. The incision in the scalp includes the galea but not the pericranium. The upper concave edge of the incision may be separated from the pericranium in an upward direction to allow the bur holes to be made for ventricular puncture. The scalp flap is reflected downward as far as the external occipital protuberance. The pericranium is then incised, and, while the flap is being retracted, the suboccipital muscles are elevated from the bone down to the foramen magnum. The whole flap is held out of the way with guy sutures attached to rubber bands. Removal of the bone is carried down to the foramen magnum and upward so as to expose the transverse sinus as desired. Removal of the bone has been frequently carried high enough to permit ligation of the sinus, section of the tentorium and elevation of the occipital lobe. At closure, in order to reattach the reflected myoplastic flap, from fourteen to sixteen holes are made in the margin of the bone defect about 1 cm. apart. Babcock's rustless steel sutures are passed through the holes, through the muscle and its aponeurosis, and then tied next to the bone. The fringe of pericranium left attached to the flap is then sutured, and the scalp is closed in two layers as usual. Silk is used for the buried sutures. When drainage is instituted, rubber dam tubing of small size is carried out through a separate stab wound at some distance above the incision. The long tract makes it possible to stop drainage of cerebrospinal fluid at once by pressure when the drain is removed.

Injection into Gasserian Ganglion.—Putnam and Hampton describe a modification of Härtel's method of injection into the gasserian ganglion in which the puncture is made during a brief period of anesthesia and the position of the needle is established by means of roentgenograms taken during the procedure. This has been carried out in eighteen cases of trigeminal neuralgia, four cases of carcinoma of the mouth and one case of postherpetic neuralgia, with relief in all but one case. Of three patients with migraine, one was satisfactorily relieved, another was improved and a third was unaffected. The method appears to have certain advantages over operative section of the posterior root and also over the older methods of injection.

Archives of Surgery, Chicago

32: 1-192 (Jan.) 1936

Skeletal Changes in Malum Perforans Pedis. J. Kulowski, St. Joseph, Mo., and R. Perlman, Brooklyn.—p. 1.

*Rôle of Ileocecal Sphincter in Cases of Obstruction of Large Bowel. L. Sperling, Minneapolis.—p. 22.

*March Foot Associated with Undescribed Changes of Internal Cuneiform and Metatarsal Bones. I. H. Maseritz, Baltimore.—p. 49.

Acute Appendicitis and Associated Lesions: Some Observations on Mortality. R. N. Schullinger, New York.—p. 65.

Postanesthetic Headache. P. W. Harrison, Muscat, Arabia.—p. 99.

Neurofibromatosis, with Reference to Skeletal Changes, Compression Myelitis and Malignant Degeneration. A. Miller, Cincinnati.—p. 109.

Transplantation of Toe According to Method of Nicoladoni: Report of Case. M. I. Kuslik, Leningrad, U. S. S. R.—p. 123.

Congenital Anomalies of Gallbladder: Review of One Hundred and Forty-Eight Cases, with Report of Double Gallbladder. R. E. Gross, Boston.—p. 131.

Review of Urologic Surgery. A. J. Scholl, Los Angeles; E. S. Judd, Rochester, Minn.; J. Verbrugge, Antwerp, Belgium; A. B. Hepler, Seattle; R. Gutierrez, New York, and V. J. O'Conor, Chicago.—p. 163.

Rôle of Ileocecal Sphincter.—Sperling shows that the ileocecal sphincter is competent to withstand pressures of from 10 to 50 cm. of water, which conceivably might occur in the course of obstruction of the large intestine. A competent ileocecal sphincter at once converts a simple type of obstruction into a closed loop with all the inherent dangers of strangulation due to increased intra-enteric pressure. Experimentally, the effect of such sustained pressures is shown by the development of areas of hemorrhagic necrosis in the colon of dogs. Similar changes occur in the human colon. The term "ileocecal valve" is a misnomer; the organ is more rightly called the ileocecal sphincter. It is subject to definite nervous control, and its competence depends on the tonicity of the fibers of the sphincter. That the tone of the sphincter is increased by stimulation of the sympathetic nerves is confirmed by experiments. Also it is shown that stimulation of the distal part of the colon increased the resistance of the sphincter to back pressure to approximately three times that of the normal sphincter. It is conceivable that the resistance of the ileocecal sphincter to back pressure is greatly increased in cases of intrinsic pathologic conditions of the colon. Stimulation of the distal portion of the colon, acting through Auerbach's plexus, increases the tone of the ileocecal sphincter, making it more competent. Several important clinical observations present themselves with relation to a competent ileocecal sphincter in cases of obstruction of the large intestine. Vomiting is a late symptom in such cases. The competent ileocecal valve allows material to pass into the colon but none to be regurgitated into the small intestine and stomach. Pain, distention and obstipation may be present for several days before the onset of vomiting. Vomiting may then be due to reflexes set up by distention of the colon. In the cases cited, aspiration of the stomach resulted in the return of only a few cubic centimeters, in spite of the fact that these cases represented late stages of obstruction. Nasal suction as a method of decompression is of little value in the treatment of acute obstruction of the large intestine with considerable distention. A single roentgenogram of the abdomen of a patient with clinical intestinal obstruction should

differentiate between obstruction of the small intestine and that of the large intestine. Roentgenography is the only accurate method of determining the degree of distention and the segment of intestine involved. All acute obstructions of the large intestine exhibiting considerable distention should be treated as obstructions of the closed loop type with potential strangulation, by means of operative decompression (cecostomy). Simple mechanical obstruction of the small intestine has been treated successfully at the University Hospital by decompression by means of nasal suction (Wangensteen). Patients who present only partial or low grade obstruction of the colon can be prepared for operation by medical management, and further distention of the colon can be prevented by the use of siphonage by nasal suction.

March Foot with Changes in Bones.—Maseritz discusses the subject of march foot, concluding that it is a complication of the "strained" foot, characterized usually by a sudden onset of pain and swelling on the dorsal and, to some degree, on the plantar aspect of the middle part and forepart of the foot. Clinically there is a tenderness over the shafts of one or more metatarsal bones and commonly at the junction of the middle and distal thirds of the second and third metatarsal bones, rarely over the first or fifth. A roentgenogram, when taken immediately, frequently reveals no change but may present a fracture. Periostitis, with or without fracture, is often encountered at an early date, but then, in all likelihood, the callus is of longer duration unless the early shadow, as Runström mentioned, is that of a subperiosteal hemorrhage. Periosteal changes are more commonly seen after ten days and fractures some weeks later. The latter, though, do not always make their appearance. Also, periosteal thickening on one or the other side of the shaft is often found associated with march foot. The etiology is still debatable. Periostitis and fracture are positive observations but can be considered only as the end results of march foot. A case is cited presenting the usual changes in addition to (1) fragmentation of the internal cuneiform bone, (2) fracture of the head of a metatarsal bone and (3) fracture of the base of a metatarsal bone. These changes emphasize the possibility that fragility of bone may play an important part in the fractures of march foot. These changes partly substantiate the etiologic theories of some observers and deny those of others, and one may conclude that more serious thought and consideration should be given to the possibility of calcium disturbances in the bone proper.

Canadian Public Health Journal, Toronto

26: 575-626 (Dec.) 1935

Observations from an Epidemic of Acute Poliomyelitis in Sukkertoppen, Greenland. K. Hrolv, Randers, Denmark.—p. 575.
Essential Features of Health Program, as Seen by Provincial Medical Officer of Health. M. R. Bow, Edmonton, Alta.—p. 583.
Tuberculosis Control Abroad. W. H. Hatfield, Vancouver, B. C.—p. 586.
History of Public Health in Saskatchewan. R. O. Davison, Regina, Sask.—p. 596.
Some Aspects of Chemistry of Silicosis. C. M. Jephcott, Toronto.—p. 606.

Journal of Bacteriology, Baltimore

30: 547-672 (Dec.) 1935

Dissimilation of Glucose by Heterofermentative Lactic Acid Bacteria. M. E. Nelson and C. H. Werkman, Ames, Iowa.—p. 547.
Anaerobic Bacteria Capable of Fermenting Sulfite Waste Liquor. A. M. Partansky and B. S. Henry, Seattle.—p. 559.
*Characteristics of New Species of Genus Listerella Obtained from Human Sources. C. G. Burn, New Haven, Conn.—p. 573.
Relation of Oxidation-Reduction Potential to Growth of an Aerobic Micro-Organism. W. B. Wood Jr., Mary Lee Wood and I. L. Baldwin, Madison, Wis.—p. 593.
Some Quantitative Relationships in Bacterial Population Cycles. M. W. Jennison, Cambridge, Mass.—p. 603.
Chemical Biologic Study of Escherichi Coli and Three of Its Rough Variants. E. H. Rennebaum, Brooklyn.—p. 625.
Concerning the Habitat of Streptococcus Lactis. Pauline Stark and J. M. Sherman, Ithaca, N. Y.—p. 639.
Rate of Growth of Rhizobia. G. M. Cameron and J. M. Sherman, Ithaca, N. Y.—p. 647.

New Species of Genus Listerella from Human Sources.—Burn states that during 1933 and 1934 four persons died at the New Haven Hospital from an infection caused by an unusual organism, in which sepsis, focal necrosis of the liver and meningitis were the predominant features. The organism is described as a small non-spore forming gram-positive bacillus that has a tendency to form short chains and small clumps in broth. A clear beta zone of hemolysis is produced in blood agar plates. Hemolysis of blood in meat infusion broth also occurs in twenty-four hours at 37 C. Cultural and morphologic characteristics indicate that this organism is probably a new species of the genus Listerella. Specific agglutinin and absorption tests show that the four strains of this new pathogen are identical. It is pathogenic for rabbits, guinea-pigs, mice, monkeys and man. Lesions produced by the organism consist primarily of a focal necrotizing process and exudation, which are most marked in the liver. Localization of the organism in the central nervous system of rabbits and monkeys results when it is inoculated into the venous blood system. Intravenous inoculations into guinea-pigs cause multiple myocardial abscesses instead of meningitis. Intracerebral inoculations of minute quantities of this organism directly into the subarachnoid space invariably produce an extensive suppurative meningitis in rabbits, guinea-pigs, mice and monkeys. Intraperitoneal inoculations into guinea-pigs cause localization of the organism in the central nervous system without evidence of myocardial involvement. This route of inoculation for rabbits and mice proves fatal in forty-eight hours if optimal dosages are employed. Macacus rhesus monkeys show a remarkable degree of resistance, surviving the infection even after it has once become established within the central nervous system.

Journal of Biological Chemistry, Baltimore

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Serum Calcium Response to Ingested Calcium. S. Freeman, E. R. Kant and A. C. Ivy, Chicago.—p. 1.
Studies of Multivalent Amino Acids and Peptides: V. Cystine Cyamidene. J. P. Greenstein, Boston.—p. 35.
Spectrophotometric Studies: V. Technic for Analysis of Undiluted Blood and Concentrated Hemoglobin Solutions. D. L. Drabkin and J. H. Austin, Philadelphia.—p. 105.
Determination of Chlorides in Biologic Fluids by Use of Adsorption Indicators: Use of Dichlorofluorescein for Volumetric Microdetermination of Chlorides in Cerebrospinal Fluids and Blood Serum. A. Saifer and M. Kornblum, Brooklyn.—p. 117.
Quantitative Measurement of Enzyme Tyrosinase. M. Graubard and J. M. Nelson, New York.—p. 135.
Tungstic Acid Precipitation Method for Extraction of Estrogenic Substance from Urine. S. C. Freed, I. A. Mirsky and S. Soskin, Chicago.—p. 143.
Influence of Ingestion of Raw Pancreas on Blood Lipids of Completely Depancreatized Dogs, Maintained with Insulin. I. L. Chaikoff and A. Kaplan, Berkeley, Calif.—p. 155.
Activation of Enzymes: III. Rôle of Metal Ions in Activation of Arginase: Hydrolysis of Arginine Induced by Certain Metal Ions with Urease. L. Hellerman and Marie E. Perkins, Baltimore.—p. 175.
Some Reactions of Ammonolyzed Parathyroid Hormone. R. G. Roberts, W. R. Tweedy and G. H. Smullen, Chicago.—p. 209.
Chemical Studies on Pituitary Gonadotropic Hormone. L. C. Maxwell and F. Bischoff, Santa Barbara, Calif.—p. 215.
Further Studies Pertaining to Provitamin D of Plant and Animal Sources. R. M. Bethke, P. R. Record and O. H. M. Wilder, Wooster, Ohio.—p. 231.
Studies in Amino Acid Metabolism: I. Fate of Glycine, *dl*-Alanine and *d*-Alanine in Normal Animal. J. S. Butts, M. S. Dunn and Lois F. Hallmann, Los Angeles.—p. 263.
Feeding Experiments with Mixtures of Highly Purified Amino Acids: VII. Dual Nature of "Unknown Growth Essential." Madelyn Womack and W. C. Rose, Urbana, Ill.—p. 275.
Id.: VIII. Isolation and Identification of New Essential Amino Acid. R. H. McCoy, C. E. Meyer and W. C. Rose, Urbana, Ill.—p. 283.
Effect of Fluorine on Phosphatase Content of Plasma, Bones and Teeth of Albino Rats. Margaret Cammack Smith and Edith M. Lantz, Tucson, Ariz.—p. 303.
Chemistry of Human Epidermis: II. Iso-Electric Points of Stratum Corneum, Hair and Nails as Determined by Electrophoresis. V. A. Wilkerson, Washington, D. C.—p. 329.
Studies on Magnesium Deficiency in Animals: VII. Effects of Magnesium Deprivation, with Superimposed Calcium Deficiency, on Animal Body, as Revealed by Symptomatology and Blood Changes. H. G. Day, H. D. Kruse and E. V. McCollum, Baltimore.—p. 337.
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Effect of Ingested Fat on Sterol Metabolism of White Rat. H. C. Eckstein and C. R. Treadwell, Ann Arbor, Mich.—p. 373.
Specific Polysaccharide from Bacillus Calmette-Guérin (BCG). E. Chargaff and W. Schaefer, New York.—p. 393.
Experiments on Extraction and Stabilities of Vitamin B (B_1) and of Lactoflavine. Bertha Bisbey and H. C. Sherman, New York.—p. 415.
Crystalline By-Product Obtained in Large Scale Extraction of Theelin and Theelol. A. W. Dox, W. G. Bywater and F. H. Tendick, Detroit.—p. 425.

Journal of Comparative Neurology, Philadelphia

63: 1-172 (Dec. 15) 1935

Volumetric Measurements of Contractile Elements of Rods and Cones. C. M. Osborn, Boston.—p. 1.

Cellular Structure of Neural Tube. F. C. Sauer, Wichita, Kan.—p. 13.

Corticifugal Fiber Connections of Cortex of Macaca Mulatta: Temporal Region. F. A. Mettler, Ithaca, N. Y.—p. 25.

Specific Responses Elicitable from Subdivisions of Motor Cortex of Cerebrum of Cat. J. W. Ward and S. L. Clark, Nashville, Tenn. —p. 49.

Development and Morphology of Cerebellum in Opossum: Part I. Early Development. O. Larsell, Portland, Ore.—p. 65.

Morphologic and Functional Development of Membranous Labyrinth in the Opossum. O. Larsell, Portland, Ore.; E. McCrady Jr., and A. A. Zimmermann, Chicago.—p. 95.

Intramedullary Course of Dorsal Root Fibers of Each of First Four Cervical Nerves. K. B. Corbin and J. C. Hinsey, San Francisco. —p. 119.

Morphology of Neurons Migrated from Ganglion Nodosum of Vagus in Birds. Margaret E. Brown, New York.—p. 127.

Neurofibrillar Development of Cat Embryos: Extent of Development in Telencephalon and Diencephalon up to Fifteen Millimeters. W. F. Windle, Chicago.—p. 139.

Journal of Experimental Medicine, New York

63: 1-156 (Jan. 1) 1936

Studies on Toxin Production of Shiga Bacilli. E. Waaler, Oslo, Norway. —p. 1.

Pathology of Pneumococcus Infection in Mice Following Intranasal Instillation. G. Rake, New York.—p. 17.

Infectious Fibroma of Rabbits: III. Serial Transmission of Virus Myxomatosum in Cottontail Rabbits, and Cross-Immunity Tests with Fibroma Virus. R. E. Shope, Princeton, N. J.—p. 33.

Id.: IV. Infection with Virus Myxomatosum of Rabbits Recovered from Fibroma. R. E. Shope, Princeton, N. J.—p. 43.

*Inhibition of Shwartzman Phenomenon. T. Ogata, New York and Tokyo, Japan.—p. 59.

Immunologic and Chemical Investigations of Vaccine Virus: III. Response of Rabbits to Inactive Elementary Bodies of Vaccinia and to Virus Free Extracts of Vaccine Virus. R. F. Parker and T. M. Rivers, New York.—p. 69.

Colony Morphology of Tubercle Bacilli: V. Influence of the Hydrogen Ion Concentration of Culture Medium on Colony Form. K. C. Smithburn, New York.—p. 95.

Experiments on Active Immunization Against Experimental Poliomyelitis. P. K. Olitsky and H. R. Cox, New York.—p. 109

Relation of Leukosis to Sarcoma of Chickens: II. Mixed Osteochondrosarcoma and Lymphomatosis (Strain 12). J. Furth, New York. —p. 127.

Id.: III. Sarcomas of Strains 11 and 15 and Their Relation to Leukosis. J. Furth, New York.—p. 145.

Inhibition of Shwartzman Phenomenon.—Ogata confines his discussion to a series of experiments concerning the inhibition of the Shwartzman phenomenon by means of active bacterial filtrates, and he finds that the phenomenon can be inhibited if an additional intravenous injection of a potent bacterial filtrate is given within one hour prior to or following the skin preparatory injection. The inhibitory effect of the additional intravenous injection takes place within the limits of certain quantitative relationships. Thus, if the skin is prepared with a large amount of filtrate, the inhibition is absent or incomplete. Similarly, if a large amount of filtrate is used for the provocative injection, there occurs no inhibition. The inhibition described is of a transitory nature. The additional intravenous injection given several hours before or after the skin preparation has no inhibitory effect. The inhibition can be obtained only with filtrates capable of eliciting the Shwartzman phenomenon. Bacterial filtrates of low reacting potency as well as nonbacterial substances produce no inhibition. The mechanism of the inhibition remains unknown. The inhibition of the Shwartzman phenomenon cannot be interpreted as an anaphylactic desensitization, for the following reasons: 1. Inhibition takes place if the additional intravenous injection is given simultaneously or shortly before and after the preparatory injection. Obviously an anaphylactic desensitization cannot be expected to occur before sensitization is induced. 2. There is no specificity of inhibition. A great deal of experimental evidence in the literature supports the possibility that processes exemplified by the Shwartzman phenomenon take place in induced and spontaneous bacterial and virus infections. The factors responsible for the Shwartzman phenomenon and derived from infected foci may induce a state of reactivity in tissues and organs removed from the sites of initial infection. When the state of reactivity establishes itself, discharge of the same factors into the blood stream would then elicit severe hemorrhagic lesions in these reactive sites. The mechanism might then be responsible for pathologic lesions scattered through the body, and the inhibitory reaction described in this paper might prevent their occurrence.

Journal of Immunology, Baltimore

29: 427-538 (Dec.) 1935

Blood Grouping of Rwala Bedouin. W. M. Shanklin, Beirut, Lebanon (Syria).—p. 427.

Standardization of Antidysenteric Serum (Shiga) by Polysaccharide Precipitating Test (Zozaya). K. Kurauchi and S. Nagata, Dairen, Manchuria.—p. 435.

Purification of Diphtheria Toxin and Antoxin. K. Ando and T. Komiyama, Dairen, Manchuria.—p. 439.

Antigenic Properties of Bacteria Combined with Antibodies. L. Olitzki, Jerusalem, Palestine.—p. 453.

Reactions Between Lipoids and Antibodies: I. Iso-Electric Point and Composition of Aggregates Obtained on Adding Beef Heart Lipoid to Syphilitic Serum. H. Eagle, Philadelphia.—p. 467.

Id.: II. Iso-Electric Point and Composition of Heterophile Lipoid Antibody Aggregates. H. Eagle, Philadelphia.—p. 485.

Concentration of Antistreptococcus Plasmas of Different Antitoxic Potencies. P. P. Murdick and Jessie L. Hendry, Albany, N. Y. —p. 501.

Toxigenic Properties of Hemolytic Streptococci from Human Infections. A. Wadsworth and Julia M. Coffey, Albany, N. Y.—p. 505.

Capacity of Boiled Erythrocytes to Remove Agglutinins: Note. W. C. Boyd and Elizabeth H. Tayian, Boston.—p. 511.

Limited Observations on Antistreptolysin Titer in Relation to Latitude. A. F. Coburn and Ruth H. Pauli, New York.—p. 515.

Observations on Action of Human and Animal Blood on Meningococcus. N. Silverthorne and D. T. Fraser, Toronto.—p. 523.

Journal of Nervous and Mental Disease, New York

83: 1-124 (Jan.) 1936

Function of Cerebellum from Clinical Standpoint. K. Goldstein, New York.—p. 1.

Lipoma and Osteolipoma of the Brain. S. J. Sperling and B. J. Alpers, Philadelphia.—p. 13.

*Psychiatric Aspects of Myxedema. A. J. E. Akelaitis, Rochester, N. Y. —p. 22.

Congenital Stenosis of Aorta: Cerebral Complications. B. Finesilver, New York.—p. 37.

Study of Permeability of Hemato-Encephalic Barrier of Chinese Patients by Walter's Bromide Test. T. H. Suh, Peiping, China.—p. 43.

Psychiatric Aspects of Myxedema.—Akelaitis declares that in every case of myxedema not complicated by a psychosis there is a specific mental condition characterized essentially by psychomotor retardation and fatigability. Since the patients appreciate their difficulties, they are apt to be depressed and irritable. This is dependent on the degree of myxedema and the individual. Stuporous conditions may occur in myxedema, as illustrated by one of his cases. There is no specific type of psychosis associated with myxedema. The most frequent type of disturbance is a dysergastic (delirious-hallucinatory) reaction characterized by a clouding of consciousness, which may progress to complete disorientation, vivid hallucinations that are not primarily complex determined, unsystematized delusions of persecution and excitability. Myxedema may precipitate a psychosis in an individual with latent psychotic tendencies. In such a case the type of psychosis may be determined by the prepsychotic personality as seen in another of the author's cases. Definite improvement occurs under treatment with thyroid, and the treatment should be individual in each case of myxedema. It is advisable to start with small doses of thyroid, because these patients are extremely sensitive to the extract.

Military Surgeon, Washington, D. C.

77: 297-362 (Dec.) 1935

Oxygen Administration by Nasal Catheter: Adaptability to Military Medical Requirements. H. B. Porter.—p. 348.

Toxic Goiter and the Brain. F. J. Vokoun.—p. 350.

The Black Widow Spider. W. H. Allen.—p. 352.

Missouri State Medical Assn. Journal, St. Louis

33: 1-38 (Jan.) 1936

*Hyperpyrexia Produced by the Hot Bath in Treatment of Syphilis. C. C. Dennie, M. Polsky and A. N. Lemoine, Kansas City.—p. 1.

Mongolism in a North American Indian. A. Bleyer, St. Louis.—p. 13.

Reaction of Water on Staining of Blood Smears: Discussion of Its Influence. R. B. H. Gradwohl, St. Louis.—p. 14.

Preliminary Stage of Labor. B. G. Hamilton, Kansas City.—p. 17.

Encephalitis: Virus Neutralization Test as an Aid in Differential Diagnosis. G. O. Broun and J. Ruskin, St. Louis.—p. 19.

Hyperpyrexia in Treatment of Syphilis.—Dennie and his associates assert that efficient temperatures can be produced in syphilitic patients by the use of the hot bath. They believe

that in some way the defense mechanism of the body is raised and the virility of the organism lowered simultaneously by the use of hyperpyrexia. Experimental work seems to show that temperatures of 104 F. and higher set the defense mechanism in motion. In the cases presented it was not necessary to keep the temperatures at this level for long periods (ten minutes). With the exception of early seronegative syphilis, inadequately treated syphilis with recurrent manifestations and early malignant syphilis, heat should not be used in the early types of syphilis. Heat is best applied in the later forms of syphilis, no matter what the manifestations. The provocative Wassermann effect was produced in 20 per cent of the seronegative cases. By the application of heat alone it has been shown that syphilitic manifestations disappear temporarily; if subsequent treatment with heavy metals is employed, they disappear permanently. Heat is an efficient therapeutic agent in recurrent neurosyphilis when malaria has already been used: the manifestations in the somatic system disappear with promptness. The authors predict that heat as an adjunct to the treatment of latent syphilis will become an integral part of the adequate treatment of syphilis. Malaria still remains supreme as the treatment of neurosyphilis. Heat as a therapeutic agent is probably the equal of malaria when used in other than neurosyphilis. The work presented is experimental and is not presented with the idea that all the statements are absolutely proved. They have shown that any form of hyperpyrexia enhances subsequent treatment.

Nebraska State Medical Journal, Lincoln

21: 1-40 (Jan.) 1936

Diabetes Mellitus: Statistical Analysis of One Hundred and Twenty Cases Treated at the Outpatient Department of the University of Nebraska. M. Margolin, Omaha.—p. 1.

Management of False Labor and Management of First Stage of Labor. E. M. Hansen, Omaha.—p. 6.

Second Stage of Labor. F. P. Murphy, Omaha.—p. 8.

Use of Forceps: Difficulties and Dangers. L. A. Swanson, Hastings. —p. 11.

Management of Third Stage of Labor. H. S. Morgan, Lincoln.—p. 14.

Postpartum Care. H. E. Harvey, Lincoln.—p. 17.

Splenectomy. R. H. Whitham and H. H. Everett, Lincoln.—p. 19.

Building a Country Surgical Practice. A. V. Wortman, Curtis.—p. 22.

Diagnosis and Treatment of Anemia: I. Classification of Anemia. J. C. Sharpe, Omaha.—p. 25.

New England Journal of Medicine, Boston

213: 1215-1274 (Dec. 19) 1935

Electrocardiographic Diagnosis of Acute Cardiac Infarction, with Especial Reference to Value of Precordial Leads. J. M. Faulkner, Boston. —p. 1215.

Secondary Carcinomas of Large Bowel. E. L. Young Jr., Boston. —p. 1219.

Reticulocyte Responses in the Pigeon Produced by Material Effective and Noneffective in Pernicious Anemia, with Description of Histologically Different Reactions of Bone Marrow. G. L. Muller, Rutland, Mass.—p. 1221.

Spinal Anesthesia: Agents, Methods and Indications. M. Saklad, Providence, R. I.—p. 1226.

Comparison of Postoperative Complications Following General and Spinal Anesthesia. B. Rapoport, Boston.—p. 1235.

Progress in Neurology in 1934. J. Loman, Boston.—p. 1238.

213: 1275-1328 (Dec. 26) 1935

Stones in Common and Hepatic Bile Ducts. F. H. Lahey and N. Swinton, Boston.—p. 1275.

Prostigmine in Diagnosis of Myasthenia Gravis. H. R. Viets and R. S. Schwab, Boston.—p. 1280.

Recent Outbreak of Food Poisoning in Shoreham, Vt. R. F. DeWitt, Plymouth, N. H.—p. 1283.

*Practical Limitations of Vaccine and Serum Therapy. A. B. Wadsworth, Albany, N. Y.—p. 1285.

Progress in Study of Cardiovascular Disease in 1934. S. McGinn, Boston.—p. 1293.

Limitations of Vaccine and Serum Therapy. — Wadsworth points out that vaccine therapy is of great use in the prevention of infection by developing an immunity before infection has taken place, whereas serum therapy is limited to the treatment of infection. Immunization with vaccines requires time for the active immunity to develop and thus varies greatly with the different vaccines. Nevertheless, vaccines are useful under certain conditions and in certain types of infection, which may be defined as the prolonged infections of low grade, in which the disease process is not developing an adequate immunity and requires the further stimulation that might be derived from judicious treatment with a potent vaccine. Immunity to bacterial infection can be and is obtained by immunization with dead bacterial cells or their toxins, whereas it is extremely doubtful whether an effective immunity against the virus diseases can be obtained without the introduction of the living virus and the development of some form of disease process in the tissues. Dead bacterial material may induce an extremely high degree of immunity, which subsides and becomes latent when immunization has stopped, just as it does after the recovery of a person from bacterial infection. After recovery from the virus diseases, a second infection is extremely rare. The immunity is lasting, practically permanent for the duration of life. Similarly, after the administration of a living virus in a vaccine the immunity is likely to be lasting, with extremely rare exceptions—as, for example, in the case of smallpox that develops in a person who has been vaccinated. Serum therapy is passive immunization in contrast to active immunization—vaccine therapy. Progress in the development of serum therapy, as in preventive immunization, has been hampered by obsessions regarding the specificity of the different hemolytic streptococci with relation to a particular disease. The strains differ and, within certain limitations, can be classified; but the author's studies of 1,500 cultures from all sources has established the fact that the same strains are found in scarlet fever as in septic sore throat or erysipelas, and they occur in about the same percentages in each disease. There is as yet no definition of a hemolytic streptococcus specific to scarlet fever, septic sore throat, erysipelas or any other streptococcic infection. Attempts are now being made to improve and broaden the therapeutic action of the serums. The difficulty has been that, in the attempt to broaden the valence, the potency has been sacrificed. Serum therapy in streptococcic infection is further complicated by the fact that there are certain differences in the action of antitoxic and antibacterial serums not as yet fully understood. Conflicting opinion regarding the practical value of antimeningococcus, antipneumococcus and antistreptococcus serums in the treatment of infection during the past twenty years is to be attributed to the variation in the potency of the serums that have been available for treatment.

New York State Journal of Medicine, New York

36: 1-54 (Jan. 1) 1936

Genesis of Renal Calculi: Pathologic Physiologic Considerations. A. Randall, Philadelphia.—p. 1.

Alternating Bilateral Spontaneous Pneumothorax Complicating Bilateral Artificial Pneumothorax: Case Report. C. E. Hamilton and E. Rothstein, Brooklyn.—p. 7.

Diagnostic Significance of Gallop Rhythm. C. S. Danzer, Brooklyn. —p. 10.

Treatment of Undescended Testes by Anterior Pituitary-like Principle from Urine of Pregnancy. A. Goldman, A. Stern and J. Lapin, New York.—p. 15.

Plastic Reconstruction of Nasal Deformities. K. Kahn, New York. —p. 20.

*Surgical Treatment of Corns. W. I. Galland, New York.—p. 27.

Surgical Treatment of Corns. — Galland states that the ordinary clavus is amenable to operative treatment. The operation must eliminate the factors that produce the recurrence of the clavus—the hyperkeratosis, the bursa and the juxta-articular prominences. The operation is simple and devoid of any great risk of complications. He has performed it during the last four years without any complicating incident. No infections have been encountered and without exception these patients have been able to walk around with a fair degree of comfort within four days after operation. Several interns and nurses operated on for corns have continued their duties without interruption following this procedure.

Ohio State Medical Journal, Columbus

31: 905-992 (Dec. 1) 1935

Progress in Tuberculosis: Prevention, Bacteriology, Immunology, Chemistry and Pathology. C. A. Doan, Columbus.—p. 921.

Id.: Hematology. B. K. Wiseman, Columbus.—p. 925.

Id.: Collapse Therapy. G. M. Curtis, with collaborators C. H. Benson and L. E. Barron, Columbus.—p. 933.

Clinical Aspects of Alkalosis. J. H. Davis, Cleveland.—p. 936.

Conservatism in Gynecology. V. S. Counseller, Rochester, Minn.—p. 940.

Systolic Murmur in Clinical Medicine and in Insurance Examination. R. W. Scott, Cleveland.—p. 943.

Psychoanalytic Quarterly, Albany, N. Y.

4: 537-688 (Oct.) 1935

Amenhotep IV (Ikhnaton): Psychoanalytic Contribution to Understanding of His Personality and Monotheistic Cult of Aton. K. Abraham.—p. 537.
History of an Impostor in the Light of Psychoanalytic Knowledge. K. Abraham.—p. 570.
The Problem of Psychoanalytic Technic. F. Alexander, Chicago.—p. 588.
Pecking in Chickens: Note. D. M. Levy, New York.—p. 612.
Unconscious Values in Certain Consistent Mispronunciations. K. A. Menninger, Topeka, Kan.—p. 614.
Inhibitions, Symptoms and Anxiety. S. Freud.—p. 616.
Karl Abraham's Contribution to Applied Psychoanalysis. H. Sachs, Boston.—p. 627.

Public Health Reports, Washington, D. C.

50: 1751-1778 (Dec. 13) 1935

Job Analysis of Rural Health Officer: Brunswick-Greensville Health Administration Studies Number Six. J. O. Dean.—p. 1751.
Cost of Local Enforcement of the United States Public Health Service Milk Ordinance. A. W. Fuchs and L. C. Frank.—p. 1762.

Surgery, Gynecology and Obstetrics, Chicago

62: 1-128 (Jan.) 1936

Review. Clinical and Pathologic, of Parahypophyseal Lesions. C. H. Frazier, Philadelphia.—p. 1.
Evacuation of Gallbladder in Old Age. E. A. Boyden and S. A. Grantham Jr., Minneapolis.—p. 34.
Cholecystitis with Cholelithiasis: Clinicopathologic Study of Sixty Patients. B. Halpert and K. B. Lawrence, New Haven, Conn.—p. 43.
Life Expectancy in Biliary Intestinal Anastomosis. E. L. Eliason and J. Johnson, Philadelphia.—p. 50.
Pancreatic Fistula: Case with Intubation of Wirsung's Duct. W. H. Snyder Jr. and R. Lium, Boston.—p. 57.
*Physiologic Changes in Ureter Associated with Pregnancy. H. F. Traut and C. M. McLane, New York.—p. 65.
Reconstructions About Nasal Tip. C. L. Straith, Detroit.—p. 73.
Malunited Fractures Affecting Ankle Joint, with Especial Reference to Twenty-Two Cases Treated by Arthrodesis. A. G. Kimberley, New York.—p. 79.
*Relation of Chronic Cervicitis to Infection of Urinary Tract. R. D. Herrold, E. E. Ewert and H. Maryan, Chicago.—p. 85.
Carcinoma of Breast: Survival for Twenty-Four Years with Local Recurrences and Metastases in Opposite Breast and Axilla. M. C. Tod and E. K. Dawson, Edinburgh, Scotland.—p. 91.
Syphilis of Bladder. E. O. Finestone, New York.—p. 93.
Rupture of Graafian Follicle and Corpus Luteum. W. F. Hoyt and J. V. Meigs, Boston.—p. 114.

Changes in Ureter Associated with Pregnancy.—Traut and McLane state that the normal ureter of the nonpregnant woman is possessed of rhythmic peristaltic activity, which can be measured and recorded. This rhythmic peristaltic activity was definitely altered by pregnancy in varying degrees in the majority of the thirty-four patients studied. This altered peristaltic activity is expressed by diminished amplitude of the peristaltic wave, commencing in the third month of pregnancy but reaching its peak during the seventh and eighth months. After the fifth month the number of patients showing diminished ureteral response exceeds those showing normal activity. During the last month of pregnancy there seems to be a definite return of muscular irritability, as expressed by the measurement of peristalsis and response to stimulation. This diminished peristaltic activity of the ureters seen in pregnacy cannot be explained on a basis of dilatation. On the contrary, dilatation of the ureters during pregnancy is probably in great part dependent on the atony of the ureters. The etiology of this observed ureteral atony during pregnancy is, in the authors' opinion, not dependent on any mechanical factor but rather on some as yet unexplained chemical basis.

Chronic Cervicitis and Infection of Urinary Tract.—Herrold and his associates mention that coagulation of the cervix for chronic cervicitis gave satisfactory relief of symptoms referable to the urinary tract in approximately two thirds of their thirty-two patients. As yet their investigation has not proved the exact mechanics of such improvement. They favor the view that constant reinfection of the urethra and bladder, particularly with enterococci, is an important contributing factor. In many instances, clinical improvement has been coincident with a decrease of the bacterial flora of the urinary tract. On the other hand, some patients with improvement have continued to yield enterococci from cultures of the urinary sediment. It is possible that such remaining infection is more superficial than before cervical coagulation and would disappear spontaneously or by treatment after a longer period had elapsed. One arthritic patient was relieved of all symptoms within four weeks after coagulation of the cervix. There were two patients who had symptoms similar to a group that is frequently described as idiopathic fever. A diagnosis of tuberculosis had been made in these patients and one had been sent to a sanatorium in New Mexico, where it was decided after several weeks of observation that she was not tuberculous. After coagulation of the cervix the patient's temperature returned to normal and the urine cultures no longer yielded streptococci. The other patient continued to have fever after coagulation, but streptococci persisted in the urine cultures and it is possible that the infected gland bearing tissue was not all destroyed. In instances of this sort the Sturmdorf operation would seem to be preferable. One patient who had an early interstitial cystitis received definite improvement following coagulation of the cervix.

West Virginia Medical Journal, Charleston

32: 1-52 (Jan.) 1936

Benign Breast Lesions, with Especial Consideration of Borderline Tumors: Cancer of Breast and Newer Conception of Preoperative Irradiation. L. C. Cohn, Baltimore.—p. 1.
*Production of Pathologic Changes in Nervous System by Diabetes Mellitus. W. M. Sheppe, Wheeling.—p. 9.
Peptic Ulcer. T. R. Brown, Baltimore.—p. 17.
Diagnosis and Treatment of Osteomyelitis. J. O. Rankin, Wheeling.—p. 26.
The Lure of Legendary Medicine. Mrs. B. S. Preston, Charleston.—p. 32.

Changes in Nervous System in Diabetes Mellitus.—Sheppe believes that it is safe to say that advanced degrees of diabetic neuropathy are represented by degeneration of fibers in the dorsal and lateral columns and anterior horns of the spinal cord, marked degeneration of the nerve roots and extensive demyelinization of the peripheral nerve fibers. The changes frequently produced in the nervous system by the action, direct or indirect, of diabetes mellitus bring on a wide variety of neurologic manifestations, involving the higher functions of the cerebrum and the cranial nerves, either singly or in various combinations. In addition to these miscellaneous manifestations, the author has cited five cases with one necropsy to illustrate the syndrome which is produced by diabetes and which markedly duplicates in every way the manifestations of tabes dorsalis. This syndrome is characterized by progressive weakness and paralysis of the lower extremities and either partial or complete paralysis of the bladder. Before making such a diagnosis it is necessary, of course, to establish the presence of diabetes and to eliminate other diseases that might produce similar effects on the spinal cord (syphilis, pernicious anemia, cord tumor, arthritis of the spine and trauma). Diagnosticians should bear in mind the probability of the production of lesions of the central nervous system by a manifest or latent diabetes. The histologic studies and the clinical manifestations of the author's case showed that the changes encompassed by the term "diabetic neuropathy" are not confined to the peripheral nerves but occur in various portions of the cord as well. These changes consist principally of degeneration of fibers of the cord and nerve roots, followed by moderate gliosis of the cord and marked demyelinization in the peripheral nerves.

Wisconsin Medical Journal, Madison

34: 877-1016 (Dec.) 1935

Tuberculosis and the Family Doctor. H. E. Dearholt, Milwaukee.—p. 891.
Acne Vulgaris: Discussion of Some Aspects. S. M. Markson and H. L. Miller, Milwaukee.—p. 895.
Selection of Material for Toxicologic Examination. F. L. Kozelka, Madison.—p. 898.
Treatment of Bromide Intoxication. O. E. Toenhart, Madison.—p. 901.
Surgical Infection of Kidney. W. J. Carson, Milwaukee.—p. 903.
Ludwig's Angina (Suprahyoid Phlegmon). R. P. Gingrass, Milwaukee.—p. 905.
The Importance of Prenatal Care. Amy Louise Hunter, Madison.—p. 908.
Recent Methods in Prevention of Disease: Critical Review. A. B. Schwartz, Milwaukee.—p. 911.
The Diabetic as a Surgical Risk. E. M. Jordan, Green Bay.—p. 918.
Carcinoma of Testicle: Postoperative Sequels, Treatment and Comments. F. H. Kuegle, Janesville.—p. 920.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2: 1031-1082 (Nov. 30) 1935

Thyrotoxicosis: Its Medical Aspects. Horder.—p. 1031.
Id.: Its Surgical Aspects. T. Dunhill.—p. 1034.
Congenital Pyloric Stenosis, with Observations Based on Two Hundred and Nine Consecutive Cases. W. A. Thompson and W. F. Gaisford.—p. 1037.
*Quantitative Estimation of Vitamins A and D in Various Food Substances Cooked and Fresh. Katharine H. Coward and Barbara G. E. Morgan.—p. 1041.
Immediate Operation in Acute Appendicitis: Further Note on Sixty-Six Consecutive Cases. H. C. W. Nuttall.—p. 1045.

Vitamins A and D in Cooked and Fresh Foods.—Coward and Morgan estimated the vitamin A potencies of milk, butter, egg yolk and various vegetables quantitatively in terms of the international unit by comparison with one sample of cod liver oil of known potency, a test on the oil being made simultaneously with the test on each food substance. The boiling of the vegetables in a manner similar to that used in ordinary cooking did not destroy any vitamin A. Boiled carrots, cabbage and runner beans have been shown to be valuable sources of vitamin A, in view of the amount that can readily be eaten. Their potencies are about one third, one seventh and one tenth respectively of an average sample of summer butter, which contains 60 units per gram. Tables are given showing the vitamin A and D potencies of various foods expressed as the number of international units per gram of food and also as the number of units in a "portion" of the food usually eaten.

Journal of Tropical Medicine and Hygiene, London

38: 301-312 (Dec. 16) 1935

Initial Impressions of Atabrine Plasmochin in Treatment of Malaria in Uganda. A. F. Brown.—p. 301.
Control of Bilharzia Infection in Swaziland. F. G. Cawston.—p. 305.
Bacillus Pseudotetanicus Anthracoides. W. L. Forsyth and A. A. Salam.—p. 306.

Lancet, London

2: 1217-1274 (Nov. 30) 1935

Traumatic Epilepsy. C. P. Symonds.—p. 1217.
*Treatment of Hematemesis and Melena with Food: Mortality. E. Meulengracht.—p. 1220.
Radiologic Aspects of Anomalies of Intestinal Rotation. E. L. Rubin.—p. 1222.
Induction of Cancer by Cracked Mineral Oils. C. C. Twort and J. M. Twort.—p. 1226.
The U Wave of the Electrocardiogram. E. Hinden.—p. 1228.
Arterial Embolectomy in Case of Brachial Embolism. V. Riddell.—p. 1230.
Arterial Embolism. G. R. Girdlestone.—p. 1231.
Atropine Poisoning: Case. V. M. Métivier.—p. 1232.
Foreign Body in Male Bladder. J. Cook.—p. 1232.

Treatment of Hematemesis and Melena with Food.—Meulengracht treated 251 cases of hematemesis and melena arising from ulcer of the stomach and duodenum by giving the patients varied food from the very first day, and plenty of it. From the day after their admission to the hospital all the patients are given a full purée diet, together with a mixture consisting of 15 Gm. of sodium bicarbonate, 15 Gm. of magnesium subcarbonate, 2 grains (0.13 Gm.) of extract of hyoscyamine (one teaspoonful three times daily), and one-half grain (0.032 Gm.) of iron lactate three times a day. The purée diet includes the following meals: tea, white bread and butter at 6 a. m., oatmeal with milk, white bread and butter at 9 a. m., dinner at 1 p. m., cocoa at 3 p. m., and white bread and butter, sliced meats, cheese and tea at 6 p. m. The dinner includes a variety of dishes; e. g., meat balls, timbale, broiled chops, omelette, fish balls, vegetable gratin, meat gratin, fish gratin, mashed potatoes, vegetable purées, vegetable soups, cream of vegetables, stewed apricots, apple sauce, gruel, and rice and tapioca puddings. The patients are allowed to have as much as they want. In a few cases (twelve) in which large quantities of blood have been lost they have been given one or two blood transfusions soon after admission. Among these 251 patients there were three deaths after the hemorrhage. The first patient did not die of hemorrhage but of perforation with diffuse peritonitis. The second patient died seventeen days after the commencement of the treatment from profuse hemorrhage from an eroded artery. The third died shortly after admission without having got as far as the "treatment with food." The author believes that this radical change in mortality brought about by treatment with food is due to something beyond its effect on the hemorrhage itself. In his experience patients with hematemesis and melena do not usually die until some time—on an average eight days—after the hemorrhage begins. Thus in his opinion they do not die directly from loss of blood but rather from general exhaustion, often with complications. This exhaustion is no doubt primarily the result of their anemic condition, but it is accentuated by extreme insufficiency in food and drink with which they are ordinarily supplied at this critical moment. With treatment with food, instead of weakening the patient still more he is given support when he needs it badly. From the present knowledge of vitamins and the principles of nutrition it seems justifiable to assume that the healing processes are not favored by an insufficient diet.

Practitioner, London

135: 725-844 (Dec.) 1935

Diseases of Thyroid. H. Rolleston.—p. 725.
Medical Treatment of Toxic Goiter. F. R. Fraser.—p. 729.
Surgical Treatment of Toxic Goiter. G. Keynes.—p. 743.
Myxedema. O. L. V. de Wesselow.—p. 757.
*Diseases of Thyroid Gland in Children. E. A. Cockayne.—p. 767.
Basal Metabolic Rate: Its Meaning and Interpretations. J. D. Robertson.—p. 780.
The Neurologic Training of the Medical Student. E. Brantwell.—p. 792.
Some Minor Digestive Errors. J. Geoghegan.—p. 800.
Some Observations on Artificial Pneumothorax. B. Hudson.—p. 813.
*Diphtheria Immunization: Some Immediate and Vital Issues. G. Bousfield.—p. 821.
Favorite Prescriptions: XII. The Pharmacopeia of Charing Cross Hospital. E. C. Warner.—p. 827.

Diseases of Thyroid in Children.—Cockayne discusses the clinical features, differential diagnosis and treatment of sporadic cretinism, epidemic cretinism, hypothyroidism, juvenile myxedema, thyrotoxicosis, simple goiter and goiter of puberty. The most important diseases of the thyroid in children are those in which its secretion is absent, deficient or excessive. Simple goiter in some families that the author has seen is inherited as a mendelian dominant. Like most hereditary conditions it may affect a single member of a family, making the diagnosis less obvious. Apart from a general enlargement of the gland there are no signs or symptoms of hypothyroidism or of thyrotoxicosis and no ill effects are felt in later life. He believes that no treatment is required. Goiter of puberty is not uncommon, especially in girls, and, though it is symptomless, it indicates that the thyroid is unable to maintain an adequate secretion without hypertrophy. Small doses of potassium iodide or tincture of iodine are advisable, and iodine ointment may be rubbed into the skin over the gland. As puberty becomes established the enlargement of the thyroid often disappears, but careful watch should be kept for any signs or symptoms of thyrotoxicosis, and, if they appear, suitable treatment should be begun without delay.

Diphtheria Immunization.—Bousfield believes that a decision on the following questions regarding diphtheria immunization is of national importance: 1. What antigens are of sufficiently proved value and general suitability for them to be employed by public health authorities and recommended to the profession for use in general practice? 2. What procedure, or alternative procedures, should be advocated as routine for the country as a whole? 3. What is to be the agreed announcement to the populace as the legitimate claim for immunization conducted on the lines of the answers to questions 1 and 2? The whole matter is at present handled far too loosely, and these points should not be decided by individual local authorities. Two families, residing in neighboring streets, are at present liable to acquire quite different ideas as to the value of immunization when they happen to live in adjoining areas with different health officers. The merits of immunization are sufficient for them to be announced from the housetops without making any exaggerated or misleading claims.

Archives des Maladies du Cœur, Paris

28: 701-772 (Nov.) 1935

Deinsulinated Pancreatic Extract After Five Years' Experience. P. Gley and N. Kisthinios.—p. 701.
*Differential Diagnosis of Pulmonary and Coronary Thrombosis. A. van Bogaert and H. J. Scherer.—p. 714.
S Wave of Electrocardiogram. I. Pines.—p. 727.

Pulmonary Embolism and Coronary Thrombosis.—Van Bogaert and Scherer discuss the difficulties sometimes encountered in differentiating between pulmonary embolism and coronary thrombosis. They cite a case in which, three days after an operation for suppurative arthritis of the left knee, a sudden, unexpected cardiovascular collapse occurred. The age (62 years), the gallop rhythm, the electrocardiographic changes and the vascular collapse caused diagnostic difficulty. Death occurred nine days after the accident as a result of terminal dyspnea. Necropsy showed an obstructive embolus of the trunk of the pulmonary artery, which was the immediate cause of death. There was also a mesarteritis of the pulmonary artery and its principal branches. There was a femoral and left hypogastric phlebitis with ectasia of the vesicular veins. No changes existed in the coronaries, myocardium or pericardium, but there was considerable dilatation of the right side of the heart. There were numerous small infarcts in the kidneys. The major question raised is by what mechanism obliteration of the pulmonary artery produces the symptoms of coronary thrombosis. It is impossible to answer this question finally. It seems, however, that pulmonary embolism produces a drop in intra-aortic pressure and therefore a distention of the right side of the heart, which compresses the coronary vessels. Thus the same mechanism is called into play which, in the case of pulmonary embolism, is merely more complicated in origin than in coronary occlusion by thrombosis.

Presse Médicale, Paris

43: 1913-1936 (Nov. 27) 1935

Reaction Therapy of Recurrent Urticaria by Histamine Ionization. N. Fiessinger and A. Gajdos.—p. 1913.
Tolerance of Bone to Metallic Foreign Bodies. F. Masmonteil.—p. 1915.
*New Clinical Form of Nicolas-Favre Disease. A. Aravantinos.—p. 1918.
Basal Fractures and Propidon. M. Lecercle.—p. 1918.

Nicolas-Favre Disease.—Aravantinos calls attention to a form of lymphogranulomatosis that is localized in the anorectal region and is acute. Its clinical manifestation is a dysentery. The patient first notices an increased frequency and loss of consistency of the stools. Soon painful tenesmus and loss of weight occur. Rectoscopic examination reveals an injected and ulcerated anorectal mucosa. Except for the tenesmus, the condition is less acute than bacillary dysentery. It is easy to understand that, if not correctly diagnosed, the condition becomes chronic and results eventually in anorectal stenosis. The author believes that it is more frequent than generally believed and is probably caused by pederasty, since it is especially common in Greece among sailors.

Riforma Medica, Naples

51: 1859-1896 (Dec. 7) 1935

Synthesis of Biotypologic Theory "Laws of Life" in Determination of Individual Byotype. N. Pende.—p. 1859.
*Abnormality of Knee Not Yet Described: Accessory Sesamoid Patella: Case. D. Vajano.—p. 1862.
Symptomatic Treatment of Encephalitic Parkinsonism. G. Aschieri.—p. 1866.

Abnormality of the Knee.—Vajano states that there are no records in the roentgen or anatomic literature showing the existence of accessory bone formations at the inferior and anterior part of the knee. The cases reported in the literature as accessory bone formations of the patella are either doubtful cases of such a condition or instances of other processes, such as bone emargination, imperfect ossification and fractures, or pathologic processes of the patella. The author reports an abnormality of the knee, consisting in the formation of an accessory or sesamoid bone having the form and structure of the patella and situated in front of the tuberosity of the tibia, at the point of insertion of the patellar ligament. The bone formation, which appeared in the right knee of a person who suffered trauma two years before, showed in the roentgenogram as a dense, even bordered and dark triangular shadow in the lateral view, and as a patellar opaque shadow in the front view. The roentgenograms of the same knee taken seven months after the accident did not show it. There was no fracture of the patella, the superior epiphysis of the tibia or the tuberosity of the tibia. The form, volume and stricture of the bone formation and the roentgenogram did not correspond to the presence of a bone fragment, post-traumatic ossification of the patellar ligament or juxtatibial osteoma. The author believes that in his case the bone formation had a congenital origin but a traumatic determining cause, since the lateral roentgenogram of the left knee of the same person shows an almost imperceptible shadow of the same form and in the same location. The front view of the left knee shows nothing abnormal. The author makes a differential study of the origin, development and significance of congenital accessory and sesamoid bones from the point of view of embryology and anatomy, human as well as comparative, and names the condition "congenital inferior patella or patellar sesamoid bones."

Arch. Arg. Enf. d. Ap. Res. y Tuberc., Buenos Aires

3: 293-395 (July-Sept.) 1935

Partial Upper Thoracoplasty: Technic. R. Finochietto and O. A. Vaccarezza.—p. 293.
*Apicocaudal and Hematologic Syndromes Following Phrenicectomy. J. Valdés Lambea.—p. 329.
Thoracoplasty: Compression of Thorax by Use of Elastic Bandages After Operation. R. Finochietto and H. D. Aguilar.—p. 338.
Benign Spontaneous Pneumothorax. B. de Carvalho.—p. 351.

Syndromes Following Phrenicectomy.—Valdés Lambea, who has performed about 1,000 phrenicectomies, states that, in cases in which the diaphragm is immobilized by a radical phrenicectomy in an exceedingly high position, a syndrome may appear in the lung of the phrenicectomized side or in the blood. The pulmonary syndrome consists in atelectasis at the base of the lung, at the apex or at both, diminution of the respiratory murmur and presence of fine bubbling râles. Atelectasis is transient as a rule, but the râles are permanent. Because of the fact that the roentgenograms and the auscultatory signs of the syndrome are the same as those given by tuberculosis in evolution, the presence of the syndrome may be erroneously interpreted as a failure of phenicectomy. The diagnosis is made by a comparison of the contrast that exists between the roentgenograms and auscultatory signs and the general improvement of the patient, proved by the lack of toxemia, cough, expectoration and fever and the normalization of the sedimentation speed of the erythrocytes. The hematologic syndrome following phrenicectomy in patients with tuberculous cavities containing caseous material consists in increased leukocytosis, with predominance of neutrophil granulocytes, and acceleration of globular sedimentation speed. The blood changes are due to the entrance of toxic material from the tuberculous foci into the circulation. The syndrome is transient and followed by improvement of the condition of the blood. The blood syndrome in patients in whom the toxemia is not intense consists in hyperglobulia with dyspnea and, in certain cases, with cyanosis. The number of erythrocytes rises, for instance, from 4,000,000 to 6,000,000, remains at the latter figure for some time and then returns to normal. Hemoptysis following phrenicectomy is rare. Only two cases of copious hemoptysis were seen by the author in about 1,000 phrenicectomies.

Revista de Cirugia, Buenos Aires

14: 449-508 (Aug.) 1935

*Spontaneous Amputation of Appendix Vermiformis. E. L. Beluffi.—p. 449.
Anatomy of Radial Nerve at Region of Elbow: Its Relation to Paralysis After Fractures. I. G. Moreno.—p. 476.
History of Surgery: The Surgeon in Old Rome. A. Zeno.—p. 489.

Spontaneous Amputation of Vermiform Appendix.—Beluffi states that spontaneous amputation of the vermiform appendix is rare. He reports five cases seen in a group of 500 appendectomies, and in one the amputation was incomplete. He concludes that the amputation is caused by perforating appendicitis which perforates the entire wall of the organ in a given annular zone. Local and mechanical factors, such as infection and adhesions, either congenital or acquired, may be associated in producing the amputation. The lost tissues of the surfaces after amputation are replaced by granulation tissues, which obturate the surfaces. The stumps of amputated appendixes, as a rule, undergo neither obliteration nor reabsorption. The preservation of their vitality and anatomic structure is secured

by the persistence of the meso-appendix and by the neovascularization from the surrounding organs to which they adhere. The stumps of amputated vermiform appendixes are potentially pathologic and may be the starting point of acute inflammatory processes. Their removal during appendectomy is necessary to secure definite recovery of the patient.

Archiv für klinische Chirurgie, Berlin

184: 191-374 (Dec. 14) 1935. Partial Index

Microscopic Demonstration and Differentiation of Inorganic Tissue Framework in Surgery: Experimental Studies on Course of Inflammation. H. Meltzer.—p. 191.
Id.: Studies on Normal and Inflamed Appendix. H. Meltzer.—p. 210.
Acute Peritonitis Caused by Virus of Inguinal Lymphogranuloma. S. Kondo.—p. 249.
*Embolism of Superior Mesenteric Artery. N. Okunj.—p. 283.
Significance of Syphilis in Surgery as Revealed by Serologic Studies. L. Jósa.—p. 299.

Embolism of Superior Mesenteric Artery.—According to Okunj, embolism of the superior mesenteric artery is a rare and grave condition of the abdominal cavity causing death in the greater number of cases. The diagnosis of the condition is made difficult by the fact that the same symptoms occur in a number of other acute abdominal diseases, such as ileus or peritonitis. The existence of a failing heart, or an acute ulcerative or vegetative endocarditis or of an atheromatous aorta is of importance in arriving at the diagnosis. Embolism of the superior mesenteric artery occurs as a rule in advanced age. Early operation consisting of resection of the involved segment of the intestine is the only method that may result occasionally in recovery.

Dermatologische Wochenschrift, Leipzig

101: 1539-1566 (Dec. 7) 1935

Diagnosis of Syphilis from Dried Drop of Blood According to Chediak. J. Wendlberger and K. Schreiner.—p. 1539.
*Reliability of Chediak's Dry Blood Method for Diagnosis of Syphilis. H. Wendeborn.—p. 1543.
Lupus Vulgaris of Scalp: Case. G. Trenk.—p. 1547.
Occupational Dermatosis of Millers. H. Hruszek.—p. 1549.
Use of Sulfur and Tar in Itching Dermatoses and Eczemas. Mitschke.—p. 1550.

Chediak's Dry Blood Method for Diagnosis of Syphilis.—Wendeborn directs attention to Dahr's report of that author's experiences with Chediak's dry blood method for the diagnosis of syphilis (abstracted in THE JOURNAL, March 31, 1934, p. 1113). Since Dahr stressed as the advantages of this method that it is simple, rapid, economical and reliable, the author decided to investigate these claims. He points out that the rapidity of the method and the inexpensiveness are convincing and he gave his attention to the problem of reliability and the question of whether the method is really simple enough to be suitable for the general practitioner. In tests in 575 cases, he carefully adhered to Dahr's modified technic of the Chediak method. As comparative methods he used the Kahn test and the quantitatively evaluated Wassermann test. The dry blood method gave positive results in thirty-six cases of latent syphilis in which either one or both of the comparative tests had failed. Compared to this positive balance the dry blood method had a negative balance of seventeen cases. The author reaches the conclusion that in view of its reliability the dry blood method is valuable for group and first examinations and in cases in which a rapid diagnosis is desirable. However, he states that it is not suitable for the consultation hour of the general practitioner and emphasizes that the dry blood test must be made by persons thoroughly experienced in laboratory work. He points out that the method is especially valuable in the cases in which the patients object to the withdrawal of blood from the vein and in cases in which the suspicion of a withdrawal of blood for the diagnosis of syphilis is to be avoided.

Deutsche medizinische Wochenschrift, Leipzig

61: 2039-2078 (Dec. 20) 1935. Partial Index

Diagnosis of Hereditary Chronic Chorea and Its Significance for Racial Hygiene. F. Kehrer.—p. 2039.
*Treatment of Chronically Increased Intracranial Pressure. H. Rosenhagen.—p. 2044.
Value of Enucleation of Palatine Tonsils Determined in Five Hundred and Nineteen Cases. W. Zabel.—p. 2046.

Treatment of Increased Intracranial Pressure.—Rosenhagen says that repeated spinal punctures are inadvisable in patients with increased intracranial pressure, because the reduction in pressure is not lasting, as the withdrawn quantity of fluid is rapidly replaced, quite often excessively ("artificial encephalohydrorrhea"), and repeated spinal punctures may thus favor the development of internal hydrocephalus. The author directs attention to other methods that make it possible to effect a reduction in pressure, such as the intravenous injection of hypertonic solutions of dextrose (40 per cent), magnesium sulfate (40 per cent) and sodium chloride (15 per cent). He describes several cases illustrating that the injection treatment with hypertonic solutions is helpful in chronically increased intracranial pressure of various origins, chronic meningitic conditions, serous meningitis, cases of increased fluid pressure in the ventricular system with and without hydrocephalus, sequels after cerebral apoplexy, cerebral tumors and their sequels, which are not amenable to surgical treatment, and disturbances that develop after concussion of the brain. He concedes that there are cases in which this treatment fails. In discussing the technic of the treatment, he says that the injection of magnesium sulfate frequently causes undesirable secondary effects, such as vertigo, anxiety and a feeling of heat or of suffocation. For this reason he gives magnesium sulfate and dextrose solution together. For instance, if 7 cc. of dextrose solution is given, 3 cc. of magnesium sulfate solution is administered; but if smaller doses are given, 1 or 2 cc. of magnesium sulfate solution is administered with 3 or 4 cc. of dextrose solution. In these combinations the injections are more effective than if dextrose solution is given alone. In cases in which the intravenous injection offers difficulties, the magnesium sulfate may be administered by rectum in a 45 per cent solution. It is advisable to mix 100 cc. of this solution with 100 cc. of oat meal gruel in order to facilitate retention in the rectum. In cases in which the administration of dextrose is inadvisable, as for instance in diabetes mellitus, the author injects 10 cc. of a 15 per cent solution of sodium chloride.

Deutsche Zeitschrift für Chirurgie, Berlin

246: 1-128 (Dec. 10) 1935. Partial Index

*Results with One Thousand Choledochotomies. F. Bernhard.—p. 1.
Traumatic Arterial Thrombosis of Forearm Appearing as Neuritis or Tendovaginitis Stenosans Dolorosa. W. Schär and G. Neff.—p. 95.
Stimulation of Brain Regeneration Through Homoplastic Transplantation of Brain Tissue in Rabbits. F. Hugi.—p. 114.
Myosarcoma of Small Intestine: Case. G. von Knorre.—p. 124.

Results Following Choledochotomies.—Bernhard reports 1,000 choledochotomies performed at the surgical clinic of the University of Giessen from 1895 to 1932. The numerical relationship between choledochotomies and cholecystectomies was as 1:5. The mortality was 9.9 per cent and was three times as great in men as in women. The most important cause of death was postoperative cardiovascular failure resulting from damage to the liver or pancreas. Peritonitis occupied a subordinate position as a cause of death. Icterus was present before the operation in 64 per cent, existed at some time in 17 per cent, and was absent in 19 per cent. The author considers icterus the most important indication for exploring the common duct. The common duct may be widened in the presence of a shrunken gallbladder or from pressure by enlarged lymph nodes. Stones were not found in 6.9 per cent; in 23.1 per cent they were present in the biliary passages alone, in 11.6 per cent in the gallbladder only and in 58.4 per cent in both the common duct and the gallbladder. The common duct was opened erroneously in thirty-five patients who had numerous small stones in the gallbladder. The author considers this indication for choledochotomy overrated. Stones were found in the common duct when the gallbladder was empty and shrunken. White bile was present in twenty-two cases and the mortality was twice the average. Stones were found in fifteen of thirty-eight patients who were submitted to a second choledochotomy. Choledochoduodenostomy is to be recommended for stricture of the lower end of the common duct and not as a primary operation for stones. An analysis of 180 deaths showed greater tendency to cholangeitis in patients who have had several operations on the biliary tracts. Diabetes was more frequent after choledochotomies than after cholecystectomies. Liver cirrhosis developed later, and with greater frequency in neglected cases. Cancer of the liver and the biliary tracts developed fifteen years after the operation, on an average, in twenty patients. Of 687 patients followed up, 389 recovered,

213 complained of mild symptoms and eighty-three complained of more pronounced symptoms. In order to determine the causes of postoperative morbidity, the author made functional studies of the contents of the stomach, determinations of sugar tolerance, and determinations of the lipase and diastase content of the blood. Actual recurrence of stones was rare. Persistence of symptoms was due principally to cholangeitis and liver damage with an abnormal blood sugar curve. Chronic pancreatitis was present in more than 10 per cent. Subacidity and anacidity were found with particular frequency in the presence of pronounced complaints. In the treatment of postoperative complaints the author stresses the value of pepsin-hydrochloric acid and of a remedy consisting of a preparation of mercury, podophyllin, melissa, camphor and caraway.

Klinische Wochenschrift, Berlin

14: 1809-1848 (Dec. 21) 1935. Partial Index

Diurnal Periodicity of Body Temperature in Human Beings. B. de Rudder and G. A. Petersen.—p. 1814.
Morphologic Investigations on Function of Cardiac Muscle. R. Böhmig.—p. 1816.
Diagnosis of Pernicious Anemia. H. Reichel.—p. 1818.
Changes in Heart Beat Sequence in Acute Pressure Exertions. W. Borst.—p. 1821.
*Sympathetic Disturbances Following Encephalography. H. Boeters. —p. 1829.

Sympathetic Disturbances Following Encephalography.—Boeters points out that the introduction of air into the cerebral ventricles causes, in addition to a general feeling of indisposition and occasionally vomiting, also temporary disturbances in the thermoregulation and in the sudoregulation. He says that Hoff called attention to the fact that encephalography produces experimental conditions, which, in connection with observations in cases presenting organic lesions of the brain, give some insight into the course and the interrelations of the central sympathetic regulatory mechanisms. In observations on human subjects and on animals, Hoff found that the morphologic blood picture is subject to a central regulation and that the cerebral irritation produced by the introduction of air causes a change in the entire sympathetic system with increased temperature and metabolism, acidosis, hyperthermia and hyperglycemia. At the same time there develop changes in the potassium, calcium and cholesterol values. The author decided to study the disturbances that develop as the result of the irritating action of the air introduced in the course of encephalography. He paid especial attention to the changes in the blood sugar values, making serial tests on forty-five patients. He found that the introduction of air, irrespective of the quantity, caused a considerable hyperglycemia, but that after from one to two hours the original values had been reached again. The greatest increase in the blood sugar values (more than 100 per cent) was observed in children. In adults, the blood sugar values usually increased by from 40 to 80 per cent. However, in epileptic patients with hydrocephalus, in incompletely cured cases of dementia paralytica and in a case of Pick's atrophy, only a slight hyperglycemia was observed. Even cases of cerebral tumor with symptoms of pressure showed only slight increases. In discussing the significance of these observations, the author points out that the patients in whom the increase in the blood sugar was slight experienced only slight subjective discomfort. He thinks that this is due to the fact that, because of a change in the intracranial pressure, the spontaneous sympathetic regulation had undergone a change in these patients. The hyperglycemia precedes all other sympathetic changes that develop after encephalography; that is, it is the most sensitive indicator of the irritation of the central sympathetic regulatory mechanism.

Wiener klinische Wochenschrift, Vienna

48: 1567-1598 (Dec. 20) 1935. Partial Index

Albuminuria During Childhood. K. Dietl.—p. 1567.
New Observations in Research on Cancer. A. Missriegler.—p. 1569.
*Simple Method for Determination of Urobilinogen in Stool. H. Fleischhacker and H. Seyfried.—p. 1573.
*Suggestions for Treatment of Intra-Uterine Asphyxia. A. F. Hecht.—p. 1575.
Short Wave Therapy of Peripheral Vascular Disturbances. H. Scholz. —p. 1576.

Determination of Urobilinogen in Stool.—Fleischhacker and Seyfried mix the stool thoroughly, weigh it and to 5 Gm. add 1 cc. of glacial acetic acid. Then they add 10 cc. of alcohol (95 per cent) and 10 cc. of ether and filter the suspension. To 2 cc. of the filtrate, 2 cc. of distilled water is added and from this is formed a series in geometrical progression, so that finally there is 2 cc. of fluid in each tube. Then they add 1 cc. of paradimethylaminobenzaldehyde to each tube. The reaction value is that degree of attenuation in the tube which just barely shows a rose color when held against a white background. In some cases the rose color is still rather intense in one tube whereas the following tube has not the slightest trace of it. In such cases the authors marked the reaction with a plus sign. They examined the reliability of this method in 148 cases by comparing the results in the attenuation series with the photometer values detected with Heilmeyer's method. It was found that when fresh stools were examined the two test methods did not reveal comparative values, but that there was a considerable degree of conformity between the results of the two tests when the stools were examined from three to eight hours after defecation. The authors explain this phenomenon and point out that tests with the attenuation series in fifty persons with normal hemoglobin metabolism gave values between 1:64 and 1:256, but they believe that the functional capacity of liver, intestine, bone marrow and other organs doubtless plays an important part. They think that values over 1:256 and under 1:64 are definitely pathologic and that even the values within the normal range may be pathologic (for instance, in case of severe anemia).

Treatment of Intra-Uterine Asphyxia.—Hecht describes observations on a new-born infant that had attacks of asphyxia and respiratory arrest during the second week of life. He found that the cardiac mechanism had been greatly changed in that the normal transmission had been replaced by an atrioventricular automatism. After explaining the mechanism and effect of this automatism, he points out that, if the intra-uterine asphyxia has the same cardiac mechanism as the one he described in the infant, it too will have a tendency to elicit inspiratory movements, which, however, would be undesirable in this case because they would lead to the aspiration of amniotic fluid. He admits that intra-uterine asphyxia should be counteracted by obstetric measures by accelerating as much as possible the process of birth. However, it is also important to prevent the inspiration of amniotic fluid. He suggests that injections of atropine administered to the mother might counteract the atrioventricular automatism. Moreover, the mother should be told to make a hyperventilatory inspiration as often as possible. Oxygen inhalation on the part of the mother might also eventually be helpful; that is, all efforts should be made to depress the respiratory center of the fetus until the child is born and able to make its first inspiration. He stresses that cardiac stimulants should not be administered to the mother, because this would stimulate the fetal respiratory center and thereby lead to the aspiration of amniotic fluid.

48: 1599-1630 (Dec. 27) 1935. Partial Index

Mistakes and Dangers in Blood Transfusion. F. von Schürer.—p. 1599.
Results of Determination of Urobilinogen in Stool in Cases of Disordered Pigment Metabolism. H. Fleischhacker and H. Seyfried.—p. 1604.
Roentgenologic Symptomatology of Sigmoiditis. E. Zdansky.—p. 1608.
*Cell Picture of Tuberculous Focal Reaction in Comparison with General and Local Blood Picture. H. Baar.—p. 1609.
Value of Some Carcinoma Reactions in Early Diagnosis of Uterine Cancer. H. Bělohradský.—p. 1612.
*Treatment of Adrenal Insufficiency. W. Raab.—p. 1620.

Cell Picture of Tuberculous Focal Reaction.—Baar calls attention to Helmreich's studies on the so-called local blood picture, by which that author means the morphologic blood changes at the site of inflammation. In tuberculosis he examines the blood of a Pirquet papule, which he considers the manifestation of a perifocal reaction that has been projected to the skin. He thinks that the morphologic changes in the blood of the Pirquet papule reflect the reactions that take place in the surroundings of the tuberculous foci in the organism. The author considered it important to know whether the reaction of the organism is uniform throughout or differs in various regions of the body, or whether the allergic reaction may be limited to one organ. To answer this question, he studied the cytomorphologic changes in the tuberculous focus and compared them with the peripheral and local blood pictures. His studies were made on patients with tuberculous pleurisy and with tuberculous meningitis. He examined the pleural exudate and

the cerebrospinal fluid before an application of tuberculin and from twenty-four to forty-eight hours after an intrapleural or an intraspinal injection of from 0.1 to 0.5 mg. of old tuberculin; blood specimens from the finger tip and from the Pirquet papule were examined at the same time. He describes and discusses the results he obtained in these studies and reaches the conclusion that the local blood picture according to Helmreich cannot be considered a projected perifocal inflammation, but he concedes that it provides a better insight into the processes that take place in the focus of the disease process than does the general blood picture. He also found that the allergic reaction may be limited to some organs and persists longest at the focus of the disease.

Treatment of Adrenal Insufficiency.—Raab shows that in the treatment of Addison's disease it is possible to reduce the required quantity of cortex extract by the administration of comparatively large doses of sodium chloride (from 8 to 20 Gm. each day). The use of sodium chloride seemed indicated in view of the reduction in the chloride content of the serum of patients with Addison's disease. He says that the sodium chloride may be given partly by intravenous infusion and partly by means of foods that have a high sodium chloride content. As another means of reducing the high cost of the treatment with adrenal cortex extract he suggests the use of the corticotropic hormone of the anterior pituitary, which is considerably less expensive. Since the pigmentation of Addison's disease does not yield completely even to a successful treatment with adrenal cortex extract, vitamin C preparations have been tried in order to counteract the pigmentation, but without satisfactory results. In this connection the author suggests that the hypophyseal pigment hormone might eventually be tried. He emphasizes that insulin treatment must be avoided in patients with Addison's disease because of their great sensitivity to this substance; relatively small quantities have been known to be fatal. The diet of patients with Addison's disease should be easily digestible and should contain large amounts of carbohydrates.

Zeitschrift f. Geburtshülfe u. Gynäkologie, Stuttgart

112: 1-124 (Dec. 13) 1935. Partial Index

*Further Efforts for an Accelerated Pregnancy Reaction. R. Brühl and W. Rieckhoff.—p. 1.
Experimental Studies on Temporary Sterilization by Hormones and Removal of Sterility Caused by Hormones. C. Clauberg.—p. 4.
Demonstration and Significance of Anterior Pituitary Hormones A and B and Consideration of One Hundred Cases. F. Heimann and W. Leschnitzer.—p. 23.
Influence of Physical Exertion and of Birth on Circulation and Metabolism of Pregnant, Parturient and Puerperal Women. W. Franz.—p. 32.

Rapid Pregnancy Reaction.—Brühl and Rieckhoff direct attention to the pregnancy test of Konsuloff, who found that hypophysectomized frogs become black following the injection of pregnancy urine into their lymph sac. The melanophore hormone eliminated in urine of pregnant women causes a diffusion of the pigment in the skin of the frog in from one to two hours. The blackening of the hypophysectomized animals becomes more noticeable because they become rather light following hypophysectomy. The authors decided to investigate the reliability of the Konsuloff test. In describing their method of hypophysectomy, they show that the hypophysectomized animals should be given several days to recuperate before they are used for the pregnancy test. In the testing of pregnancy urines the authors at first followed the directions given by Konsuloff, who claimed to have obtained results that were 100 per cent correct; however, they secured only fourteen positive reactions in twenty-five pregnant women. Further investigations disclosed that the concentration of the urine was highly important for the outcome of the test and a method was devised for the use of concentrated urine. The use of concentrated urine produced positive results in all cases of pregnancy and also in cases of carcinoma and in some cases of adnexitis. Thus there is the dilemma that if unconcentrated urine is used the reaction will be negative in some cases of pregnancy, and if concentrated urine is used it will be positive in some conditions other than pregnancy. The authors reach the conclusion that the Konsuloff frog test is not sufficiently exact to replace the Aschheim-Zondek test.

Sovetskaya Vrachebnaya Gazeta, Leningrad

Nov. 30, 1935 (No. 22) pp. 1721-1800. Partial Index

Method of Treating Intestinal Toxemia of Nurslings. V. I. Morev.—p. 1721.
Advances and New Therapeutic Methods in Diseases of Digestive Organs. D. Lampert.—p. 1727.
*Symptoms of Pulmonary Suppuration and Its Treatment with Methenamine and Autohemotherapy. V. S. Trefilov.—p. 1735.
Intermittent Physical Therapeutic Methods in Pulmonary Tuberculosis. Ya. O. Kryzhevskiy, B. M. Broderzon and M. D. Vainshtein.—p. 1743.

Pulmonary Suppuration.—According to Trefilov, abscess and gangrene of the lung represent various stages of essentially the same morbid process. Pulmonary suppurations run a variable course and present at times considerable diagnostic difficulties. The absence in the roentgenogram of a cavity does not rule out an abscess. In many cases roentgen examination reveals infiltration only. The diagnosis is made from clinical data, laboratory observations and the history. Grip and its complications play a predominant part in the etiology and pathogenesis of pulmonary suppuration. Grip pneumonias leave behind them pathologic alterations in pulmonary tissues which later favor the development of pulmonary suppuration. Of the author's thirty-two patients, 78 per cent gave a history of grip with pulmonary complications. The treatment consisted of injecting, on alternating days, 10 cc. of a 40 per cent solution of methenamine in the cubital vein. At intervals of two or three days, from 3 to 4 cc. of blood was withdrawn from a cubital vein and injected in the cellular tissue of the chest. This was gradually raised to 10 or 12 cc. The author treated ten acute and eight chronic cases of pulmonary suppuration. Eleven of the patients were discharged as completely recovered, four were markedly improved, one was not improved and two died. The author considers this combined method the most effective of the conservative methods. He feels that it ought to be tried in all limited suppurations, acute and chronic, exclusive of cases characterized by cachexia.

Finska Läkaresällskapets Handlingar, Helsingfors

77: 651-735 (Nov.) 1935

*Terminal Stages in Diseases of Liver. R. Ehrström.—p. 651.
Vaccination Against Typhoid-Paratyphoid. O. Stenvers.—p. 663.
Neurology of Schizophrenia. J. Runeberg.—p. 690.
*Senear-Usher's Disease: Case. R. Wirkberg.—p. 709.

Terminal Stages in Diseases of Liver.—Ehrström treats of the terminal stages of hepatic diseases in four groups, the first of which is characterized by conditions in which infectious factors dominate, the second by a marked chronic jaundice, an "icterus gravis," with a grave disturbance due to the organism's inability to utilize the supplied fat as a contributing cause of death and of many symptoms, including a possible hemorrhagic diathesis. In the third group are the cases with chronic portal stasis and constantly recurring ascites, together with an albumin hunger analogous to the fat hunger in the second group. The fourth form, relatively rare, is seen in the syndrome with acute onset and rapid fatal outcome designated in the literature by various terms such as cholemia, hepatargia, hepatic intoxication and "la grande insufficance hepatique" and depends, the author concludes, on an absolute hepatic insufficiency or hepatargia. He advocates omitting the term "cholemia" as a designation for hepatic disturbance to avoid unnecessary confusion and for the present rejects the term "relative insufficiency" because as yet no sharply enough defined clinical picture corresponds to it.

Senear-Usher's Disease.—Wirkberg says that about thirty cases of this disorder have been reported and describes the first instance to be reported from Scandinavia, in a man aged 24. On the face the disease localized to the nose and adjacent parts of the cheeks and was remarkably like lupus erythematodes. The scales, however, were softer and more easily removed, and on the trunk the condition greatly resembled pemphigus foliaceus. The elements were about the size of an almond and were covered by a thin soft crust. Treatment consisted in external application of potassium permanganate together with substances containing sulfur and tar, and in administration of calcium and arsenic; a complex carbamide compound of trisulfonic acid injected intravenously had no demonstrable by-effects. On discharge after two and a half months' treatment the processes in the face and anterior part of the trunk were almost completely healed; some loose crusts remained on the back.